ORDER NO. SD83012364C9

Service Manual

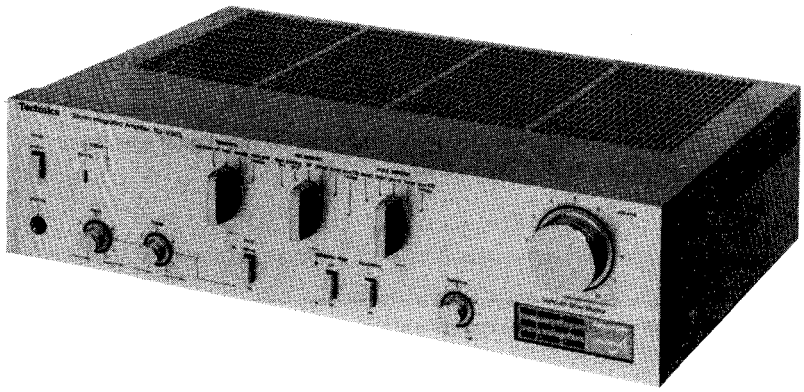
Stereo Integrated Amplifier

SU-V303

[E], [EK], [EF], [EB], [EH], [Ei], [XA], [XL], [PA], [PE], [PC]

SU-V303(K)

[E], [EK], [EB], [EH], [Ei], [XA], [PC]



* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Areas

* [E] is available in Scandinavia and Switzerland.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EB] is available in Belgium.
* [EH] is available in Holland.
* [Ei] is available in Italy.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.
* [PA] is available in Far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 45W (4Ω)
	2 × 40W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 45W (4Ω)
	2 × 40W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 45W (4Ω)
	2 × 45W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.03% (4Ω)
	0.005% (8Ω)
rated power at 40 Hz~16 kHz	0.03% (4Ω)
	0.005% (8Ω)
rated power at 1 kHz	0.007% (4Ω)
	0.003% (8Ω)
half power at 20 Hz~20 kHz	0.005% (8Ω)
half power at 1 kHz	0.003% (8Ω)
−26 dB power at 1 kHz	0.01% (4Ω)
50 mW power at 1 kHz	0.01% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.03%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.01%

Power bandwidth	
both channels driven, −3 dB	
	5 Hz~40 kHz (4Ω, T.H.D. 0.03%)
	5 Hz~50 kHz (8Ω, T.H.D. 0.02%)
Residual hum and noise	0.6 mV
Damping factor	30 (4Ω), 60 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
TUNER, AUX/CD/VIDEO	150 mV/22kΩ
TAPE 1	150 mV/22kΩ
TAPE 2	150 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	170 mV
S/N	
rated power (4Ω)	
PHONO	76 dB (82dB, IHF, A)
TUNER, AUX/CD/VIDEO, TAPE	
	91 dB (IHF A: 102 dB)
−26 dB power (4Ω)	
PHONO	69 dB
TUNER, AUX/CD/VIDEO, TAPE	70 dB
50 mW power (4Ω)	
PHONO	65 dB
TUNER, AUX/CD/VIDEO, TAPE	65 dB

Technics
Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shiba-koen, Minato-ku, Tokyo 105 Japan
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
TUNER, AUX/CD/VIDEO, TAPE	5 Hz~140 kHz (−3 dB) +0 dB, −0.2 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage and impedance	
REC OUT	150 mV
Channel balance, AUX/CD/VIDEO 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX/CD/VIDEO 1 kHz	63 dB
Headphones output level and impedance	420 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ GENERAL

Power consumption	340W
Power supply	
For Australia	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 109 × 290 mm (16-15/16" × 4-9/32" × 11-13/32")
Weight	6.7 kg (14.8 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

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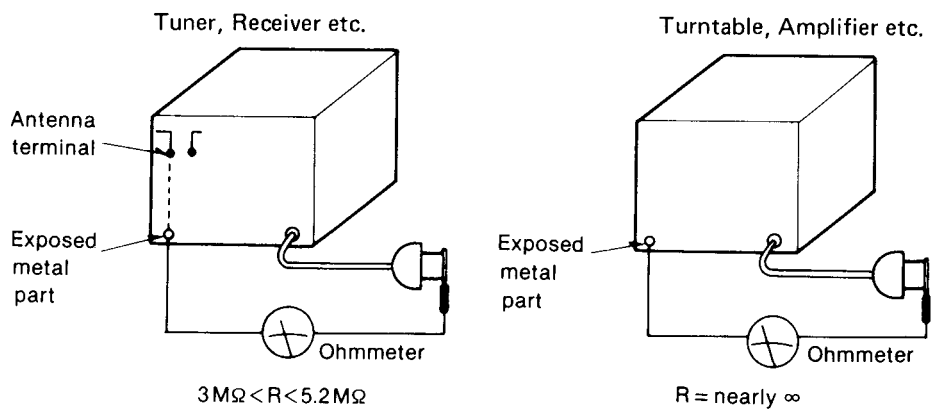
■ SAFETY PRECAUTION

1. Before servicing (such as replacement of components), unplug the power supply cord to prevent an electric shock.
2. Use only manufacturer's recommended components for safety. Check condition of power cord and replace if wear or damage is evident.
3. After servicing, be sure to restore the following to the condition in which they were originally installed.
   (1) the lead dress and
   (2) insulation barriers, insulation papers, shields and the like.
4. Before returning a serviced apparatus to a customer, make the following insulation resistance test to prevent a customer from being exposed to a shock hazard.

• Insulation resistance test (See figure below.)

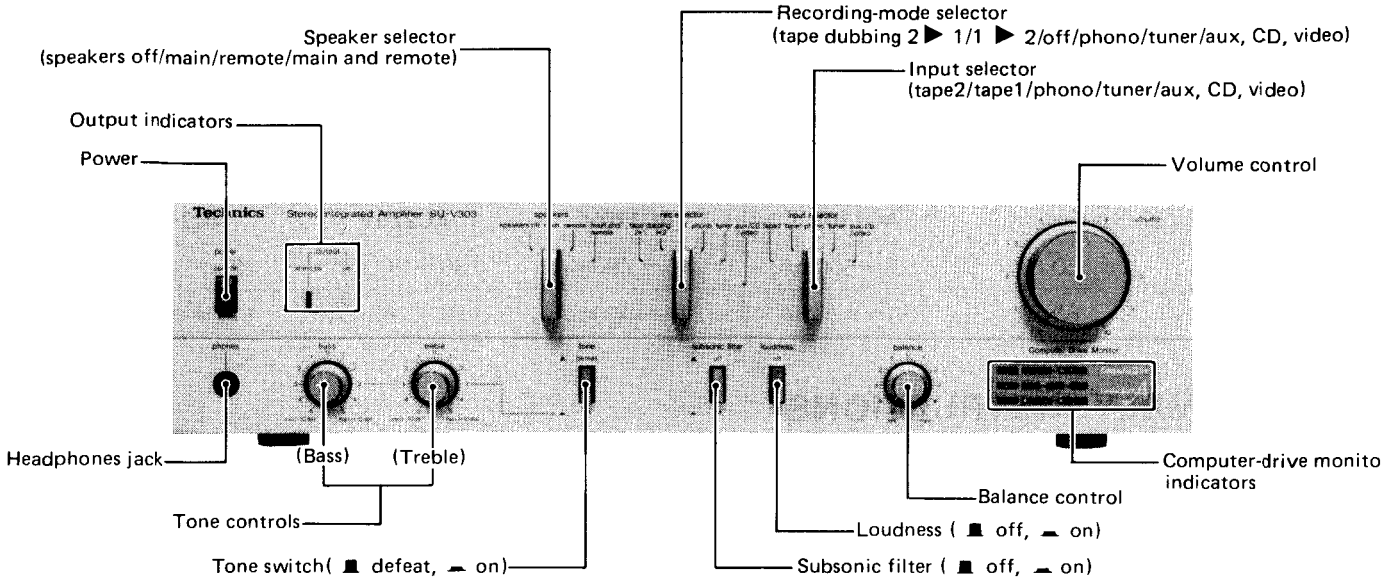
1. Unplug the power supply cord and connect a jumper wire between the two prongs on the plug.
2. Turn on the power switch of the apparatus.
3. Measure the resistance value (with an ohmmeter) between the jumpered AC plug and each exposed metalic cabinet part on the apparatus, such as screwheads, antenna, control shafts, handle brackets, etc.
   The reading should be as shown in figure below. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the apparatus should be repaired and rechecked before it is returned to a customer.

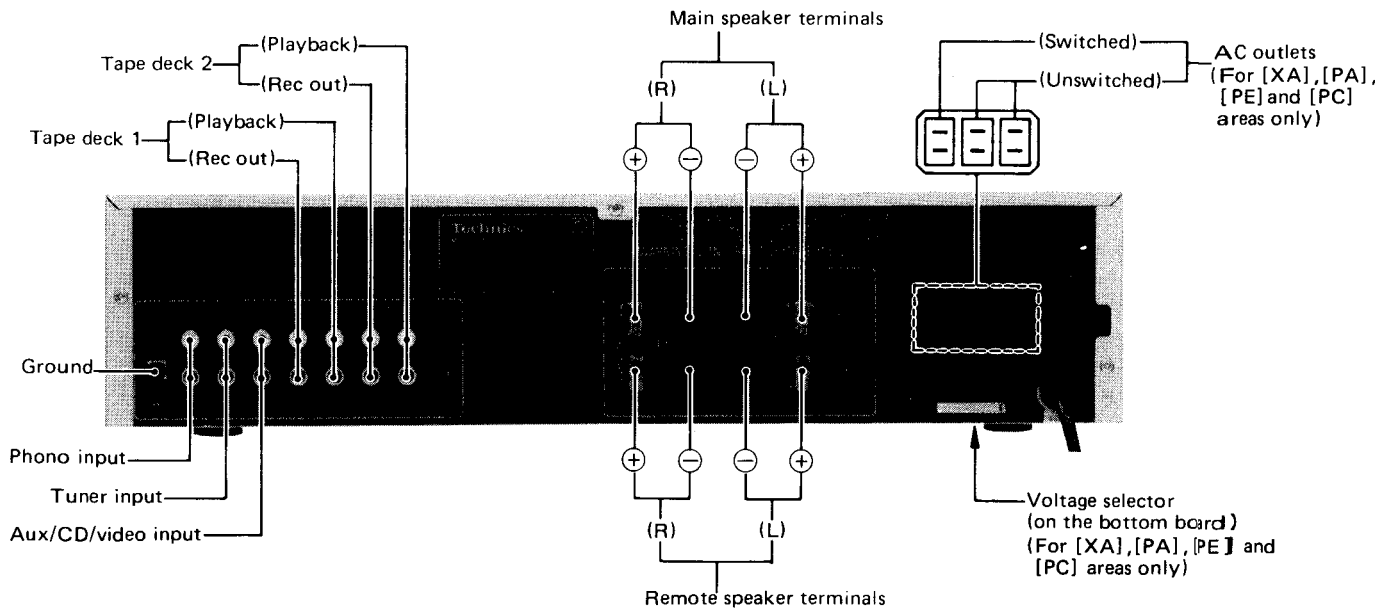


3MΩ<R<5.2MΩ　　R = nearly ∞

where, R: resistance value

■ LOCATION OF CONTROLS





- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.

* 220V (50/60Hz) for continental Europe. (Except for United Kingdom)
* 240V (50/60Hz) for Australia and United Kingdom.
* 110V/120V/220V/240V (50/60Hz) for other areas. (For other areas are provided with voltage selector)
* Phono input capacitance is about 150pF.

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if eigher of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again

Note:

When the protection circuitry functions the unit will not operate unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

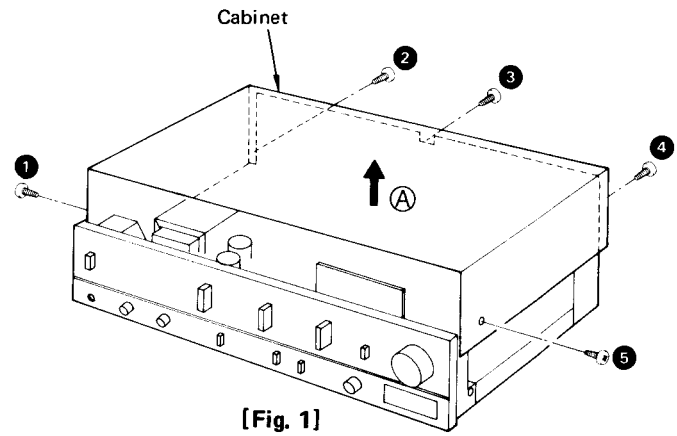
1. Turn off the power supply and short-circuit both ends of power supply capacitors (C401, C402, 6800μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Both ends of do not short between C401 and C402 by screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current is free of abnormality. The consumed current at 60Hz/50Hz in no signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC110V	AC120V	AC220V	AC240V
Consumed current	50 Hz	250 ~ 500mA	240 ~ 480mA	130 ~ 260mA	120 ~ 250mA
	60 Hz	230 ~ 470mA	220 ~ 450mA	120 ~ 250mA	115 ~ 235mA

■ DISASSEMBLY INSTRUCTIONS

• How to remove the cabinet

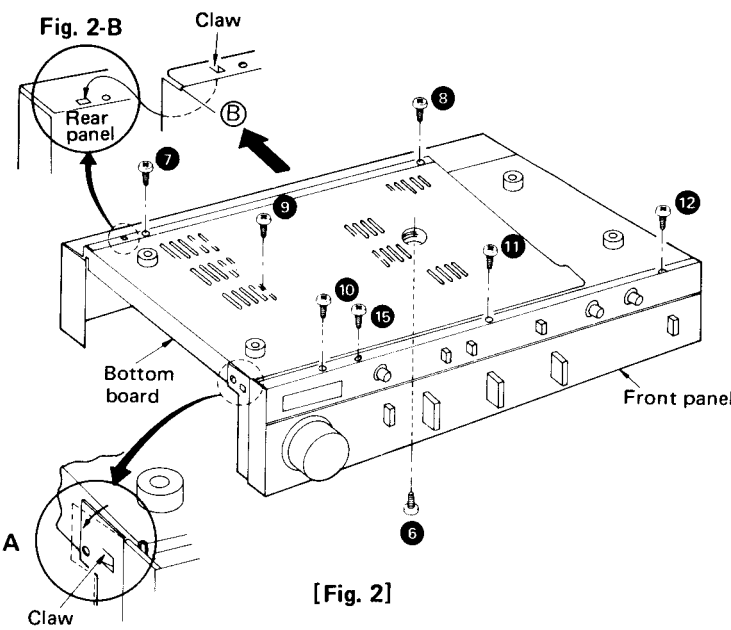
1. Remove the 5 setscrews (Fig. 1: ❶ ~ ❺) of the cabinet.
2. Move the cabinet in the direction of the arrow Ⓐ in Fig. 1.



[Fig. 1]

• How to remove the bottom board

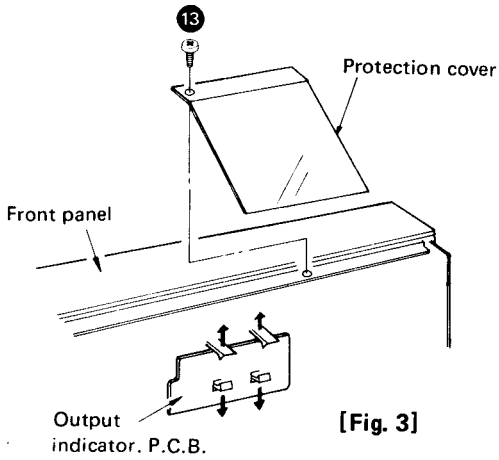
1. Remove the cabinet.
2. Remove the setscrew [Fig. 2: ❻] of the P.C.B.
3. Remove the 6 setscrews [Fig. 2: ❼ ~ ⓫, ⓯] of the bottom board.
4. Raise the rear of the bottom board, and shift the side board a little outward to release the claw from the bottom board. [Fig. 2-A]
5. Remove the bottom board in the direction of the arrow Ⓑ in Fig. 2.
6. To install the bottom board, fit the claw of the bottom board into the hole in the rear panel. [Fig. 2-B]



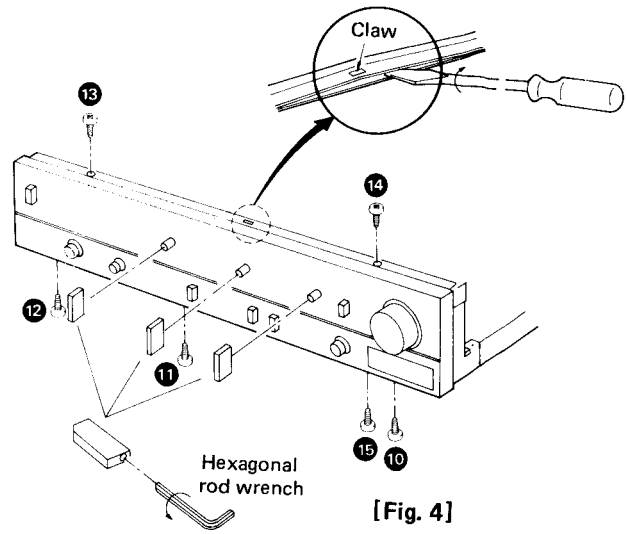
[Fig. 2]

• How to remove the front panel

1. Remove the cabinet.
2. Remove the setscrew [Fig. 3: ⓭] on the left-hand side of the front panel, and then remove the protection cover. (Protection cover is not used in sets for [XA], [PA], [PE] and [PC].)
3. Push up the upper 2 claws which fasten the output indicator P.C.B., then remove the top of the P.C.B. Next, release the lower 2 claws and remove the P.C.B. (See Fig. 3).
4. Loosen the selector knob screw by hexagonal rod wrench (M3), and pull out the knob.
5. Remove the 5 setscrews [Fig. 4: ⓾ ~ ⓬, ⓮, ⓯] of the front panel.
6. Insert a flat-head screwdriver between the chassis and front panel as in Fig. 4, and then pry open to release the claw from the panel top.
7. Remove the front panel from the chassis.



[Fig. 3]



[Fig. 4]

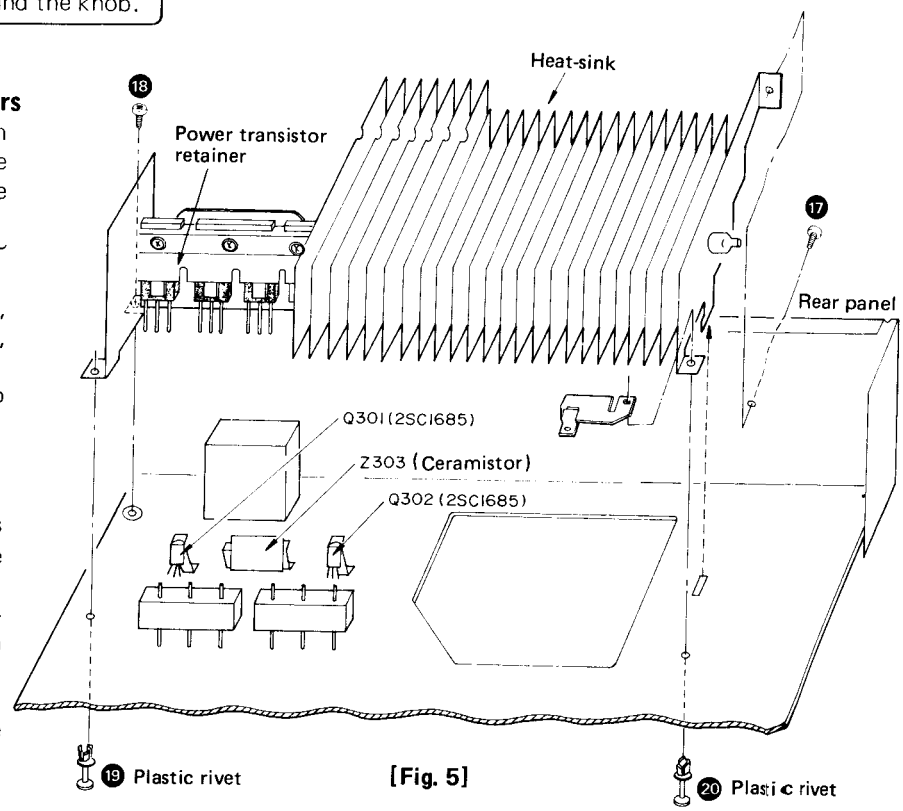
NOTE:
When fitting the selector knob, provide a clearance of about 0.7mm between the front panel and the knob.

• How to remove the power transistors

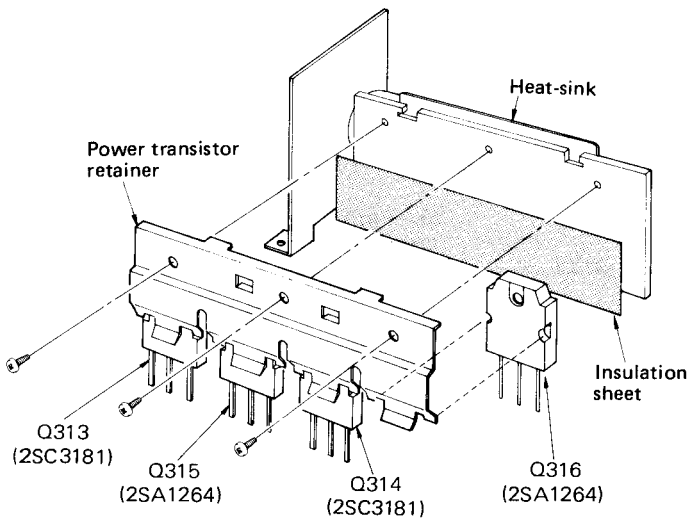
1. Remove the cabinet and the bottom board (Refer to "How to remove the cabinet" and "How to remove the bottom board").
2. Unsolder the power transistors Q313~Q316.
3. Remove the 2 setscrews [Fig. 5: ⑰, ⑱] and 2 plastic rivets [Fig. 5: ⑲, ⑳] which secure the heat-sink.
4. Remove the power transistor retainer to remove the power transistors. (See Fig. 6)

* Precautions for Fitting the Power Transistors

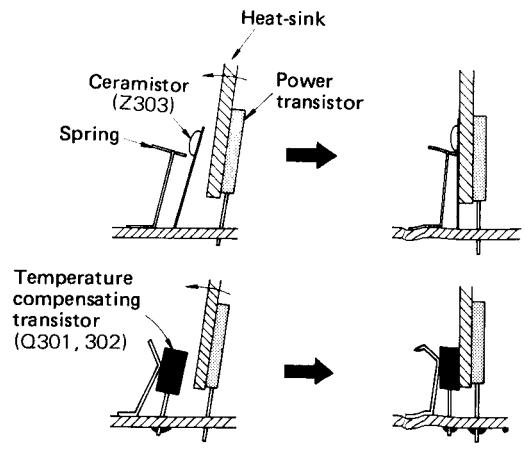
1. Do not apply a heat diffuser or the like to the insulation sheet. [Fig. 6]
2. Make sure that the ceramistor and temperature compensating transistors are in tight contact with the heat-sink. [Fig. 7]
   * Ceramistor: Element whose change in temperature and resistance is positive (proportional).



[Fig. 5]



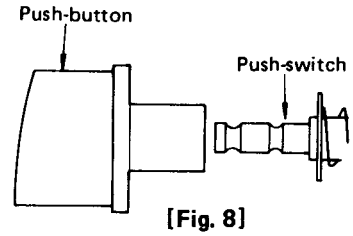
[Fig. 6]



[Fig.7]

*** Precautions for Fitting the Push-buttons**

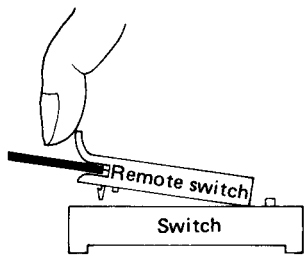
1. When replacing push-button, remove the front panel beforehand.
2. It should be fitted onto the switch with the spherical side down as in Fig. 8.



[Fig. 8]

• How to remove and fit the remote switch

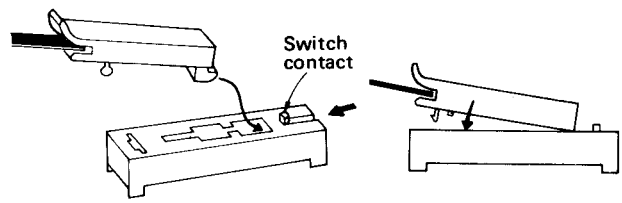
1. How to remove –
Pushing the remote switch, shift it up as in Fig. 9.



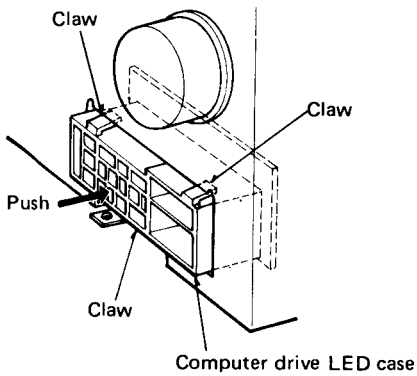
[Fig. 9]

2. How to fit –

(1) Shift the switch contact inside.
(2) Turn the remote switch (selector knob) counterclockwise.
(3) Let the remote switch claw engage with the switch, and shift the remote switch down while pushing it in.



[Fig. 10]



[Fig. 11]

* How to remove the computer drive LED case

1. Remove the cabinet and front panel. (Refer to "How to remove the front panel.")
2. Release the 3 claws of computer drive LED case (Fig. 11) to remove the computer drive LED case.
3. When replacing the computer drive LED indicators, unsolder the LED's of D712 ~ 718 and remove them from the printed circuit board along with the computer drive LED case because the case and LED's are set up into an assembly.

■ MEASUREMENTS AND ADJUSTMENTS

1. Clock Adjustment (after replacing the microcomputer)

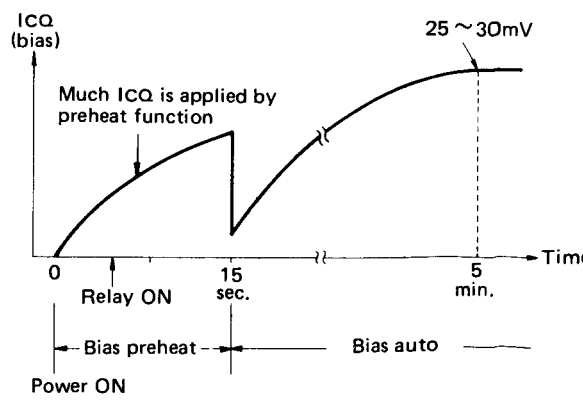
(1) Turn off the power supply.
(2) Adjust VR701 so that the time until the relay turns ON is 5 ~ 7 sec. after power ON.
* The time elongates with VR701 turned counterclockwise (in the direction of A). (Frequency decreases.)
* The time shortens with VR701 turned clockwise (in the direction of B). (Frequency increases.)

(Note) Clock frequency of 400 kHz is obtained at TP701. In the case of an ordinary frequency counter and oscilloscope, the frequency cannot be correctly measured because of the probe capacity. So, it is recommended to employ the above-mentioned method during servicing.

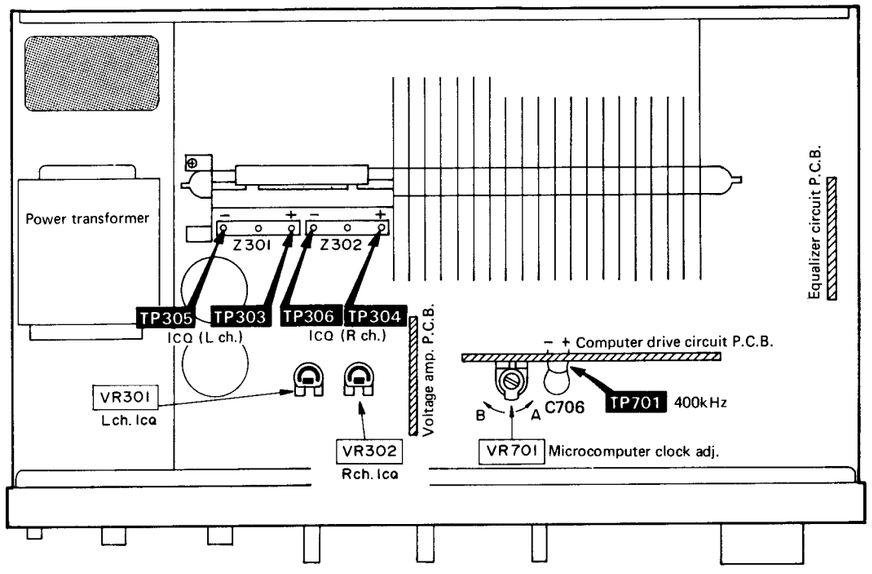
2. Idling (ICQ) Adjustment (after reparing the main amp.)

(1) After the repair, set the sound volume to minimum before turning on the power switch, and connect nothing to the speaker terminals.
(2) Completely turn ICQ control (VR301, 302) counter-clockwise.
(3) Increase the voltage applied to the amplifier gradually from 0V by means of a power supply voltage controller, and make sure of the value in the Figure on page 4 before starting the adjustment.
(4) Connect the DC electronic voltmeter to TP303 (+) and TP305 (–) [left channel] or TP304 (+) and TP306 (–) [right channel].
(5) When 5 minutes have lapsed after computer drive monitor "auto" lights up, adjust VR301 [left channel] or VR302 [right channel] to 25~30mV.

* In this set, ICQ is controlled by microcomputer, and ICQ a little more than the normal level is applied by "PRE-HEAT" for about 15 sec. after power ON. After that, the output level and transistor temperature are detected by "AUTO", thereby automatically controlling ICQ.



- **Adjustment points**



*** Checks of Protection Circuit After Repair and Adjustment**

- **Check of Muting with Power On/Off.**
  (1) Connect AC voltmeter and 8Ω load (resistor or speaker) to main speaker terminals.
  (2) Set the sound volume to a proper level.
  (3) Apply 1 kHz 100 mV signal to AUX. input terminal.
  (4) Make sure that output is gained 4 ~ 7 sec. after power switch "on", and that the output goes out immediately after power switch "off".

- **Check of Overload Detection and Protection Circuit**
  (1) Apply output signal of about 1.5V at 1kHz to AUX. input terminal.
  (2) With main speaker terminals (left channel) short-circuited by lead wire (as thick and short as possible):
  Make sure
  - relay is off.
  - output indicator "on" goes out.
  - output indicator "stand by" blinks.

  (3) Make sure the state of (2) is gained with output circuit opened. Similarly, check the right channel as well.
  * When relay is off, turn power "off" and unit for a while before turning it "on".
  Otherwise, the original conditions are not restored even when the circuit and load are normal.

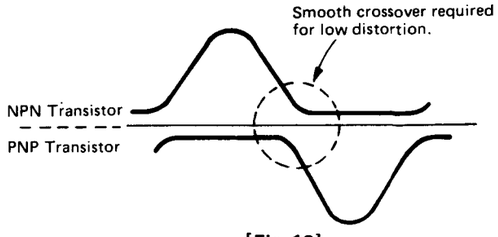
■ TECHNICAL INFORMATION

1. Description of Computer drive system

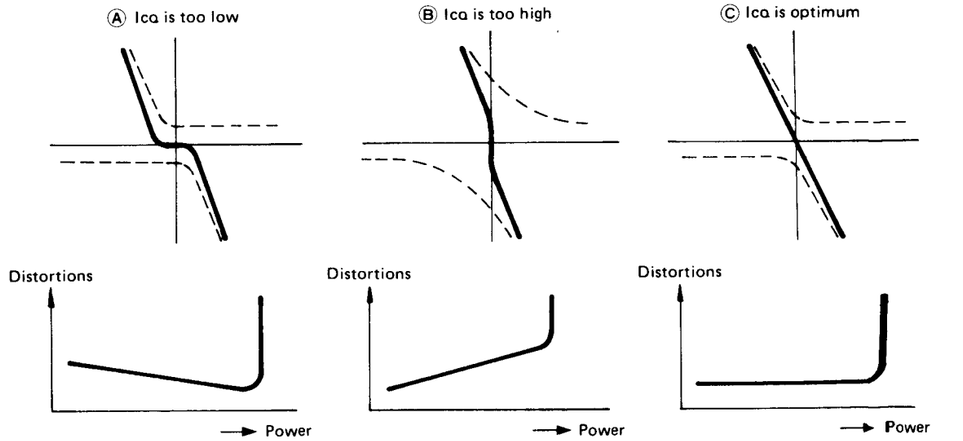
Technics'New Class A amplifier circuitry eliminates switching and crossover distortion. To further improve fidelity a "computer drive" circuit has been incorporated to eliminate transient distortion in music signal reproduction.

- **Power transistor idling current (Icq)**

The idling current through the power transistors is adjusted so that crossover distortion is minimized when switching from the NPN transistor to the PNP transistor in a complimentary design (Fig. 12).
If Icq is not adjusted properly, distortion will result as in Fig. 13.



[Fig. 12]

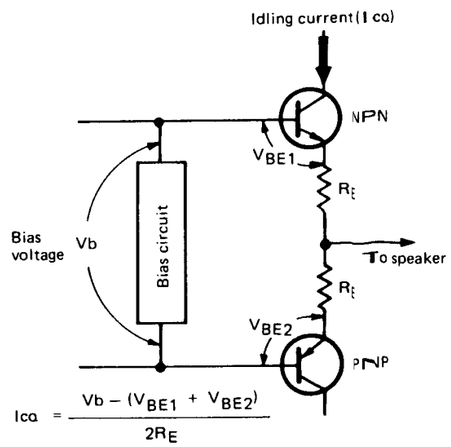


Relationship between idling current level and cross-over distortion.

[Fig. 13]

- **Idling current and bias current**

Idling current is determined by the bias voltage (Vb) of the bias circuit and the V_{BE} of each power transistor (Fig. 14). The V_{BE} varies according to the temperature of the transistor. This temperature varies instantaneously with the music signal. Unfortunately, with current designs, these instantaneous fluctuations cannot be detected due to the placement of the thermal sensor and the slow temperature change of the heat sink. Attempts have been made to include a thermal sensor as part of the output power pack. However, most power packs do not include a thermal sensor. Also, this method does not work if discrete components are used. We are still faced with the problem of stable bias operation and fast response to abrupt changes in temperature.

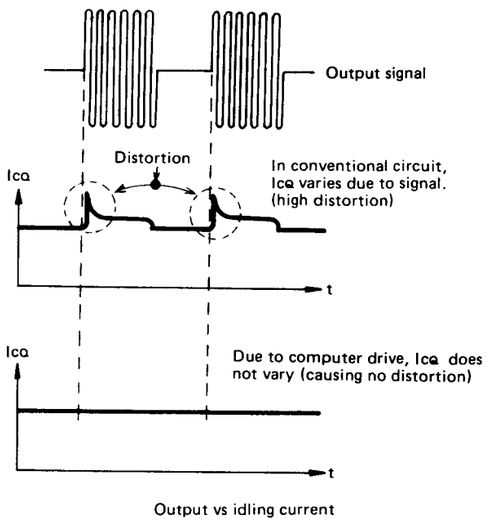


[Fig. 14]

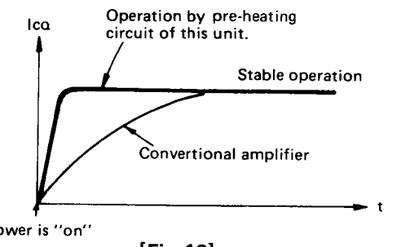
• Computer drive system

Knowing the thermal and signal characteristics of the power transistors, a system can be designed to calculate the instantaneous temperature changes and adjust for the optimum idling current. Information regarding the transistor ambient temperature and the input music signal is obtained through sensors and fed to a computer. The computer calculates the optimum idle current and maintains it at a constant level by varying the bias voltage. Figure 15 illustrates the relationship of the output signal and the idling current. Figure 17 is a block diagram of the "computer drive" system.

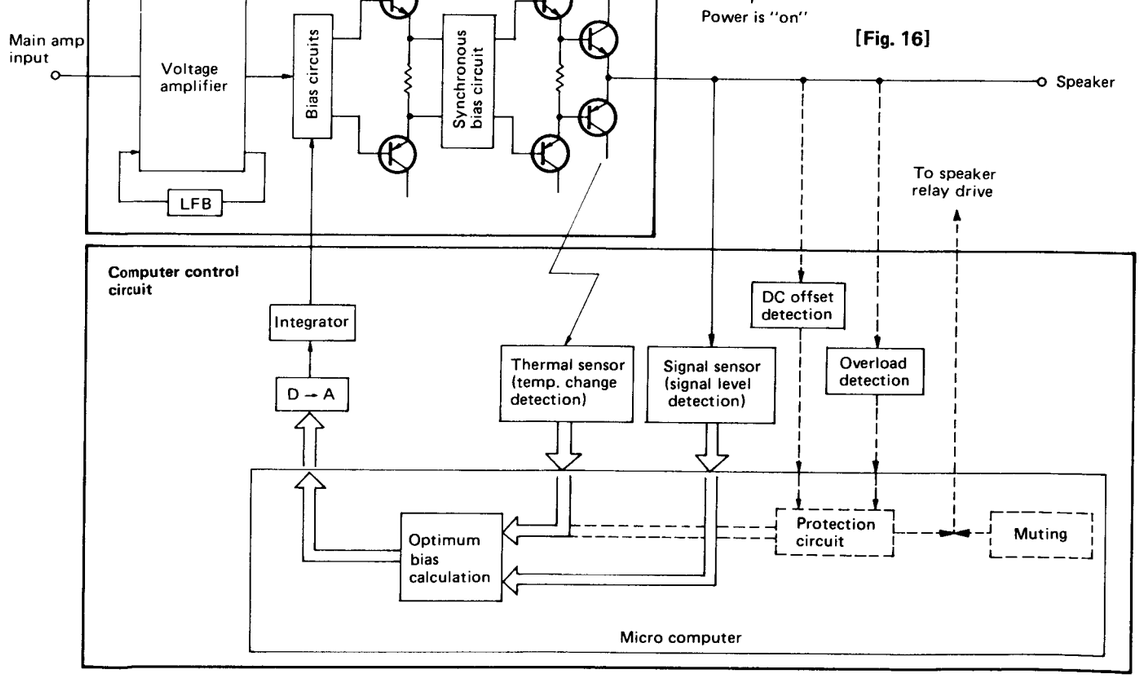
Generally, it takes several minutes for the power transistors to reach the temperature of stable operation after the power is turned on. To ensure stable and optimum performance quickly, the microcomputer forces a large amount of idling current through the power transistors for a short time. This rapidly "preheats" the transistors and the heat sink. Figure 16 illustrates the stable operation level for the convertional and new computer drive system.



[Fig. 15]



[Fig. 16]

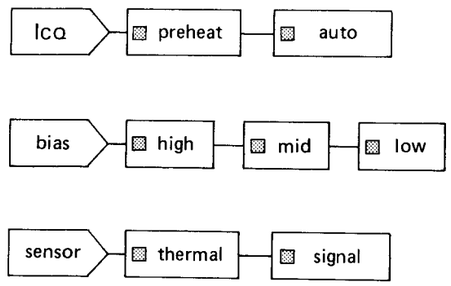


[Fig. 17]

■ OPERATION OF Icq CONTROLLER

• Computer drive monitor indicators

These indicators are used to check that stable idling current flows from the bias circuit in order to prevent transient crossover distortion.



Icq:
When the power is switched on, the radiator is preheated so that the bias circuit can immediately operate. The "preheat" indicator will illuminate at this time, and then, when the circuit is fully stabilized, the "auto" indicator will illuminate.

bias:
When the power is switched on, the bias changes from high, mid and low during the time until the idling current becomes stabilized, and the respective indicators illuminate.
Note that the display will no longer illuminate when the idling current has reached a condition of stability.

sensor:
The "thermal" sensor detects the temperature of the output transistor(s) and radiator, and the "signal" sensor detects the music signal level. Both indicators will illuminate when the sound can be heard.

• Output indicators

These indicators show the condition of the signal sent to speakers or headphones.
When the power switch is switched on, the "stand by" indicator flashes, and, when the unit is operating normally, the "on" indicator will illuminate.
Note that the "stand by" indicator will flash if the positive and negative speaker terminals or speaker connection cords are short-circuited, or if some other circuit abnormality which causes the protection circuit to function is detected. If this occurs, switch the power switch off, and then on again after first determining the cause of the problem and correcting it.

• ON-time of each indicator, and output generated at pin terminal of microcomputer (IC702)

▒ "ON" (light up) time

Output port	(4) pin CO_7	(3) pin CO_8	(2) pin CO_9	(15) pin EO_0	(16) pin EO_1	(17) pin EO_2	(18) pin EO_3	(26) pin DO_3	(23) pin DO_0
Ind. / sec.	bias low	bias mid	bias high	sensor thermal	sensor signal	ICQ auto	output stand by	output on	ICQ preheat
Power "ON"	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ	Ⓛ
0.4 sec.	▒	▒	▒	▒	▒	▒	▒		▒
0.8 sec.	Ⓗ	Ⓗ	▒	▒	▒	Ⓗ	Ⓗ		▒
0.4 sec.			▒	▒	▒		Ⓛ		▒
0.4 sec.			▒	▒	▒		Ⓗ		▒
0.4 sec.			▒	▒	▒		Ⓛ		▒
0.4 sec.		Ⓛ	Ⓗ	▒	Ⓗ		Ⓗ		▒
0.4 sec.		▒		▒			Ⓛ		▒
0.4 sec.		▒		▒			Ⓗ		▒
0.4 sec.		▒		Ⓗ	Ⓛ		Ⓛ		▒
0.4 sec.		▒			▒		Ⓗ		▒
0.4 sec.		▒			▒		Ⓛ		▒
0.4 sec.	Ⓛ	Ⓗ			Ⓗ		Ⓗ		▒
0.4 sec.	▒				▒		Ⓛ		▒
0.4 sec.	▒				▒		Ⓗ		▒
14 sec.	Ⓗ		Ⓛ	Ⓛ	Ⓛ			Relay ON	▒
∫				▒	▒	Ⓛ		Ⓗ	Ⓗ

6 sec.

* 130°C (266°F) sensor is for protection of circuit. Icq is not controlled.

[Fig. 18]

1) Preheat

When power supply is turned ON, the level of IC702 pin ㉓ becomes low. At the same time, preheat LED (D717) lights up, Q707 turns OFF and so does the computer drive lamp. Also, Q709 turns ON, then voltage is applied to LED's (D712), (D713), (D714). Each of D712, D713 and D714 is controlled by IC702 terminals ② , ③ and ④ respectively. The output voltages are shown in Fig. 18. The "high" LED lights up first, followed by "mid" LED, and then "low" LED. IC702 Pin ⑰ turns power supply ON as in Fig. 18. It becomes "H" 0.4 sec. later, then IC701 pin ① also becomes "H". IC701 pin ⑯ changes to "L" and it is applied to Q712 and Q713 through D708 and D709, causing Q712 and Q713 to turn ON. IC701 pin ⑯ delivers a large ICQ for 6 sec. after power ON (while pin ⑯ is "L"), and after that, pin ⑯ become "H". ICQ is controlled by the output of IC702 pin ②, ③, ④.

2) Signal sensor and thermal sensor

The musical signal from power amplifier is applied to IC702 pin ⑪ (pin ⑬) through D705 (D706) and IC701. When the signal changed to DC by D705 (D706) and C703 (C704), becomes higher than about 2V, then "L" input is applied to IC702 pin ⑪ (pin ⑬), and the output is delivered to IC702 pin ②,③, ④ . Also, when the temperature of heat-sink becomes higher than 60°C(122°F) the resistance of the thermistor (Z303) increases and IC701 pin ⑤ becomes "H". IC701 pin ⑫ changes to "L", then "L" input is applied to IC702 pin ⑩ . The output is delivered to IC702 pin ⑪ , ⑬ (signal sensor input) and IC702 pin ⑩ (thermal sensor input), thereby controlling ICQ through R715~719, 741 and Q712, 713.

3) Power on/off muting

When power supply is turned ON, the output of IC702 pin ㉖ is "L" for about 6 sec. as in Fig. 18, then relay RLY301 turns OFF, and D710 output "on" LED also turns OFF. The voltage of IC702 pin ⑱ alternately becomes "L" and "H" for 6 sec. after power ON as in Fig. 18, causing D719 "stand by" LED to blink. IC702 pin ㉖ output becomes "H" 6 sec. after power ON, then relay RLY301 turns ON and D710 output "on" LED lights up.

When power supply is turned OFF, "H" is applied to IC701 pin ② and IC701 pin ⑮ output changes to "L" because the time constant of C410 (3.3μF) and R414 (15kΩ) is smaller than that of C401 (6800μF) and R411 (100kΩ). The signal is put into IC702 pin ⑳ while "L" output is delivered to IC702 pin ㉖ . When pin ㉖ becomes "L", Q706 turns OFF and so does relay RLY301.

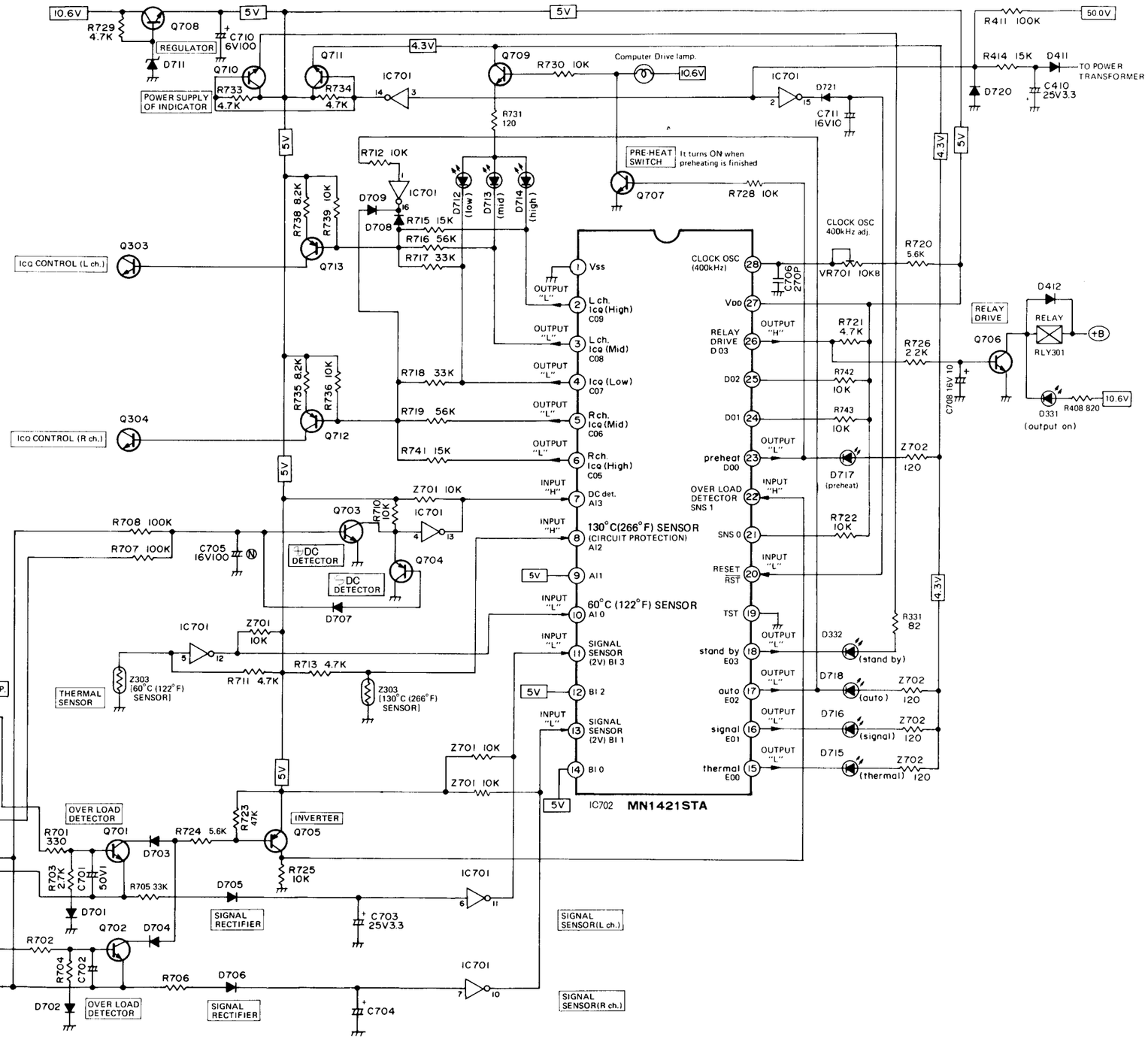
4) DC detection circuit

When the power amplifier voltage is over 2V DC. Q703 (⊕DC detection) and Q704 (⊖ DC detection) are turned ON, then "H" input is applied to IC702 pin ⑦ , and "L" output is delivered to IC702 pin ㉖ . When pin ㉖ becomes "L", relay RLY301 turns OFF the same as in power-off muting.

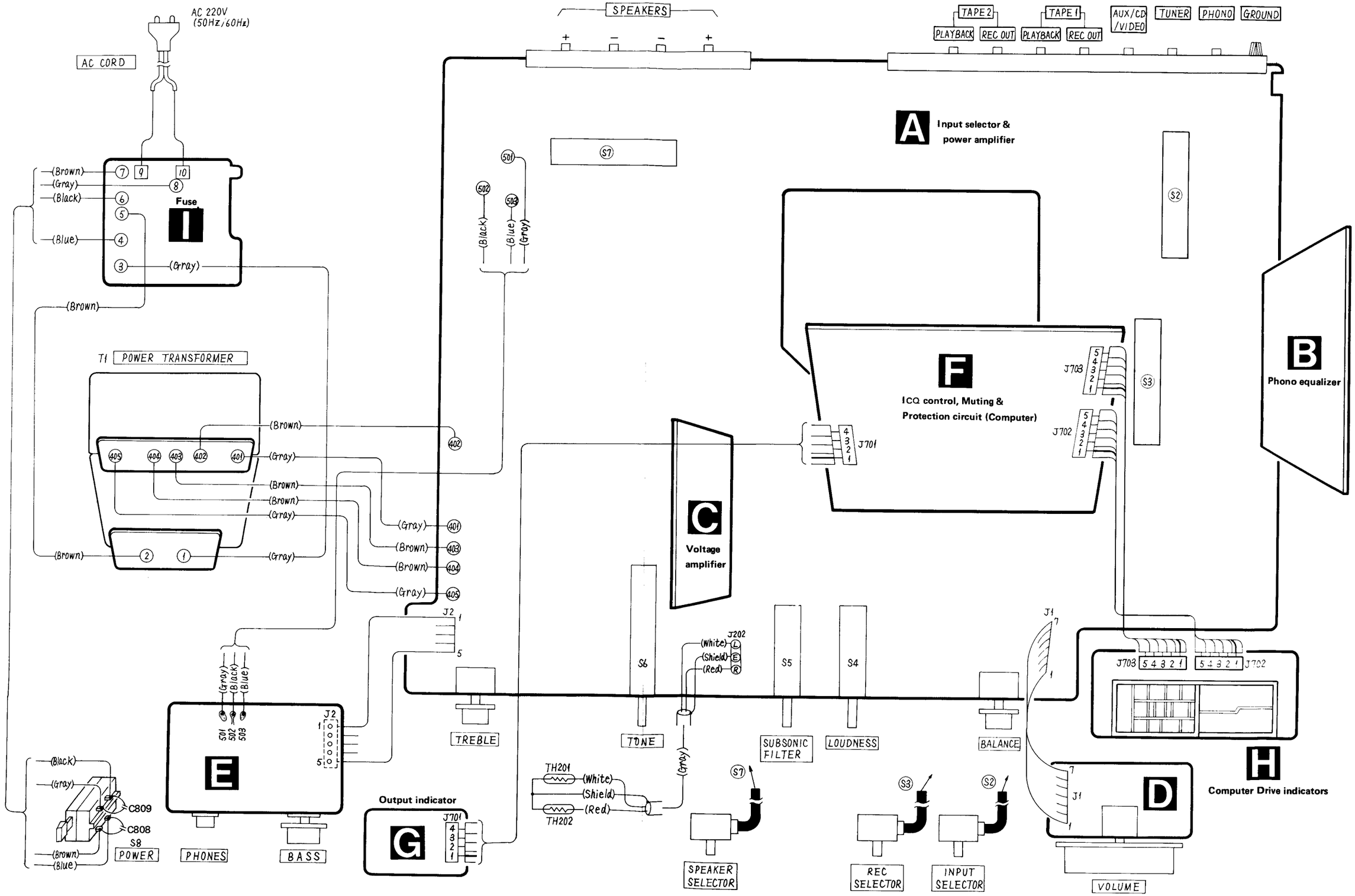
5) Overload detector circuit

When speaker terminals are short-circuited, a large amount of current flows into Z301 (Z302), and the base voltage of Q701 (Q702) increases, causing Q701 (Q702 and Q705 to turn ON. As Q705 turns ON, "H" input is applied to IC702 pin ㉒ , and "L" output is delivered to IC702 pin ㉖ . When pin ㉖ becomes "L", relay RLY301 turns OFF the same as in power off muting.

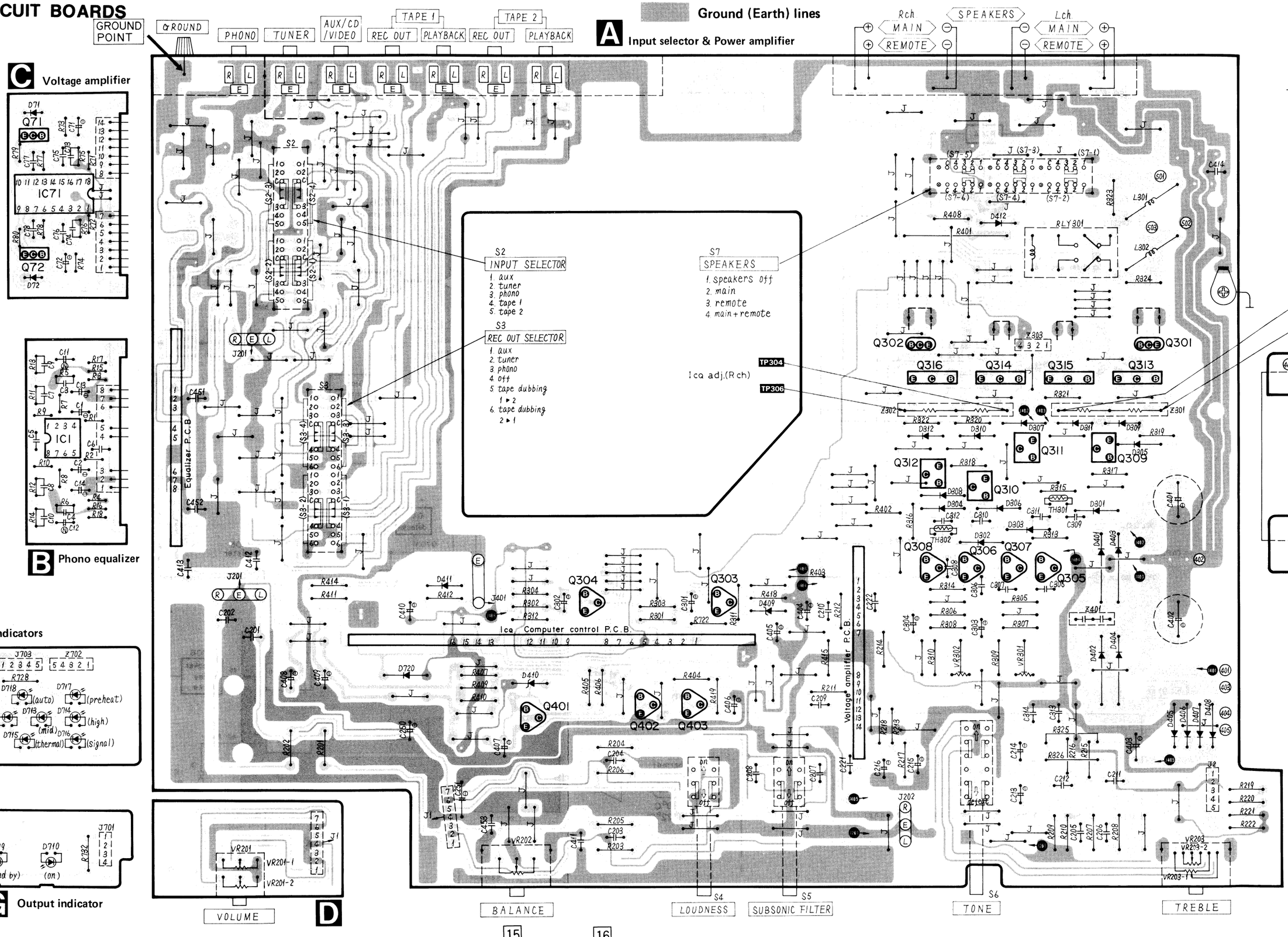
When "H" is applied to IC701 pin ㉒ , the output of IC702 pin ㉖ is held. Therefore, turn off the power switch and check the set beforehand. Otherwise, relay RLY301 will not turn ON.



■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (Top View)

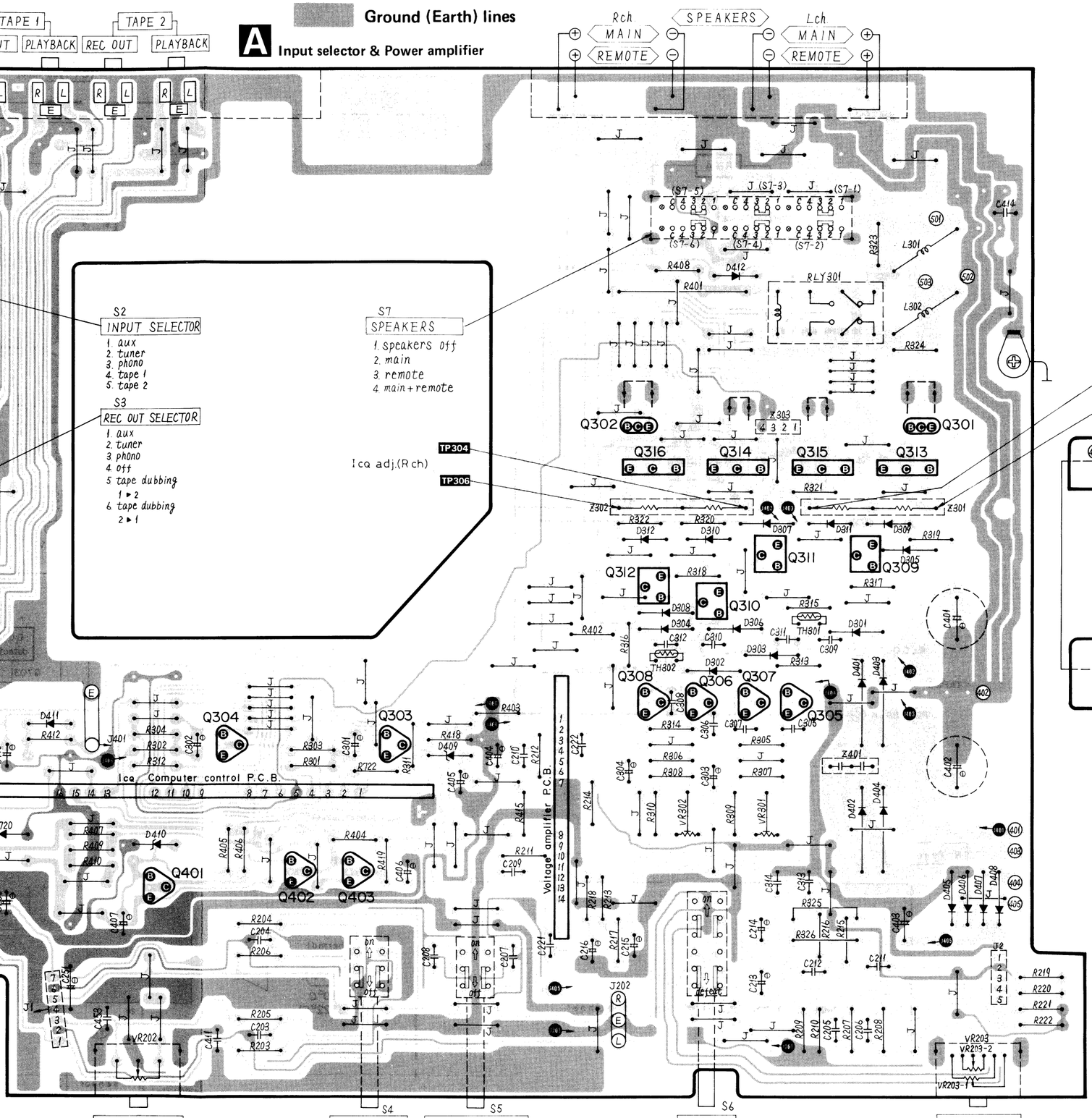


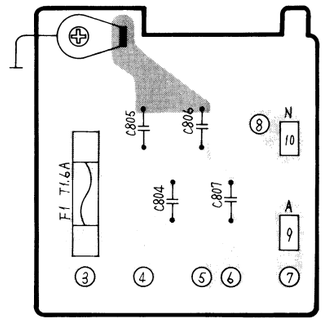
■ PRINTED CIRCUIT BOARDS



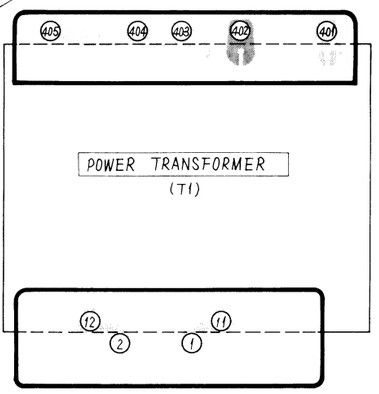
Ground (Earth) lines

A Input selector & Power amplifier

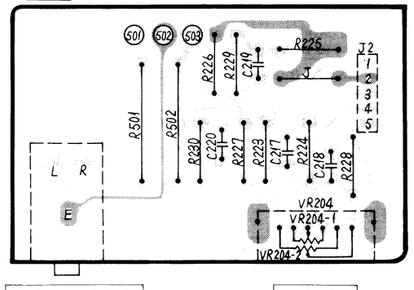




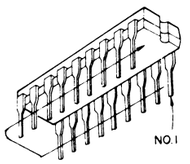
I Fuse



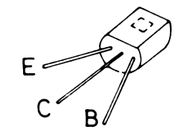
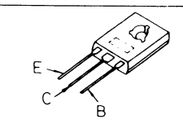
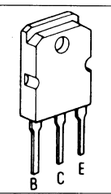
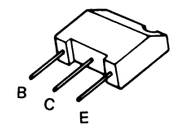
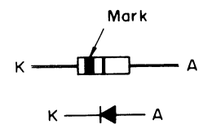
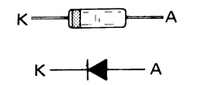
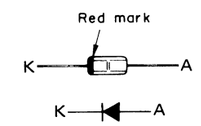
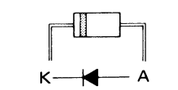
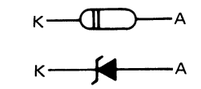
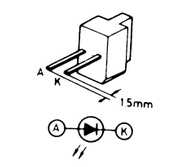
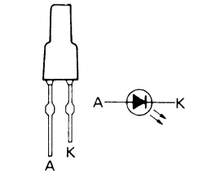
E



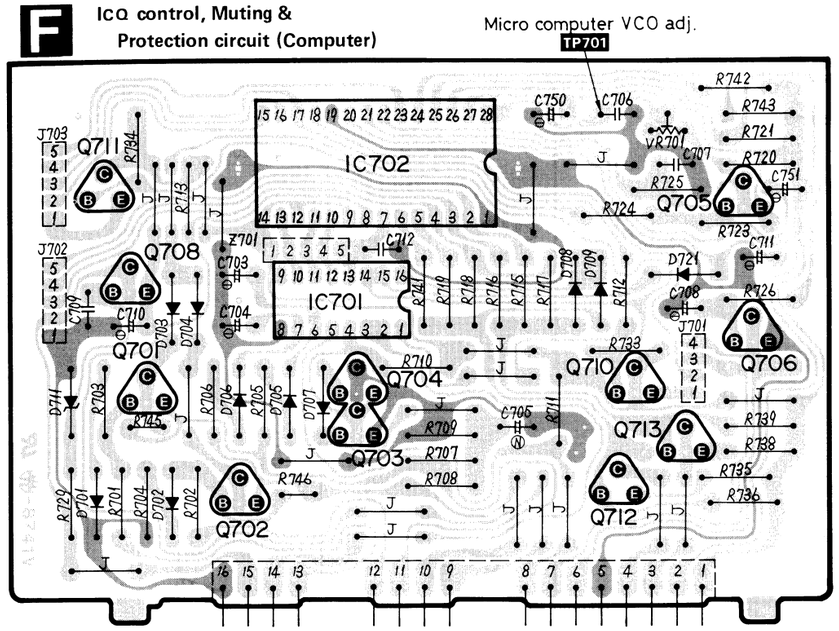
■ TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S



SVINJM2043DD	8pin
AN7062	18pin
SVITD62501P	16pin
MN1421STA	28pin

2SA1123, 2SC1685, 2SC2631, 2SA1123, 2SC1815, 2SC1845, 2SA1015, 2SC3112, 2SD788, 2SA992	2SC2824, 2SA1184
	
	2SC3181, 2SA1264
	
2SD661	MA162A
	
OA90, MA150	MA27W–A
	
SVDS3V20, SVDSR1K2	SVDMZ □□□□
	
LN820WP, LN420WP	SVDAY5533K1M SVDBG5533K-1
	

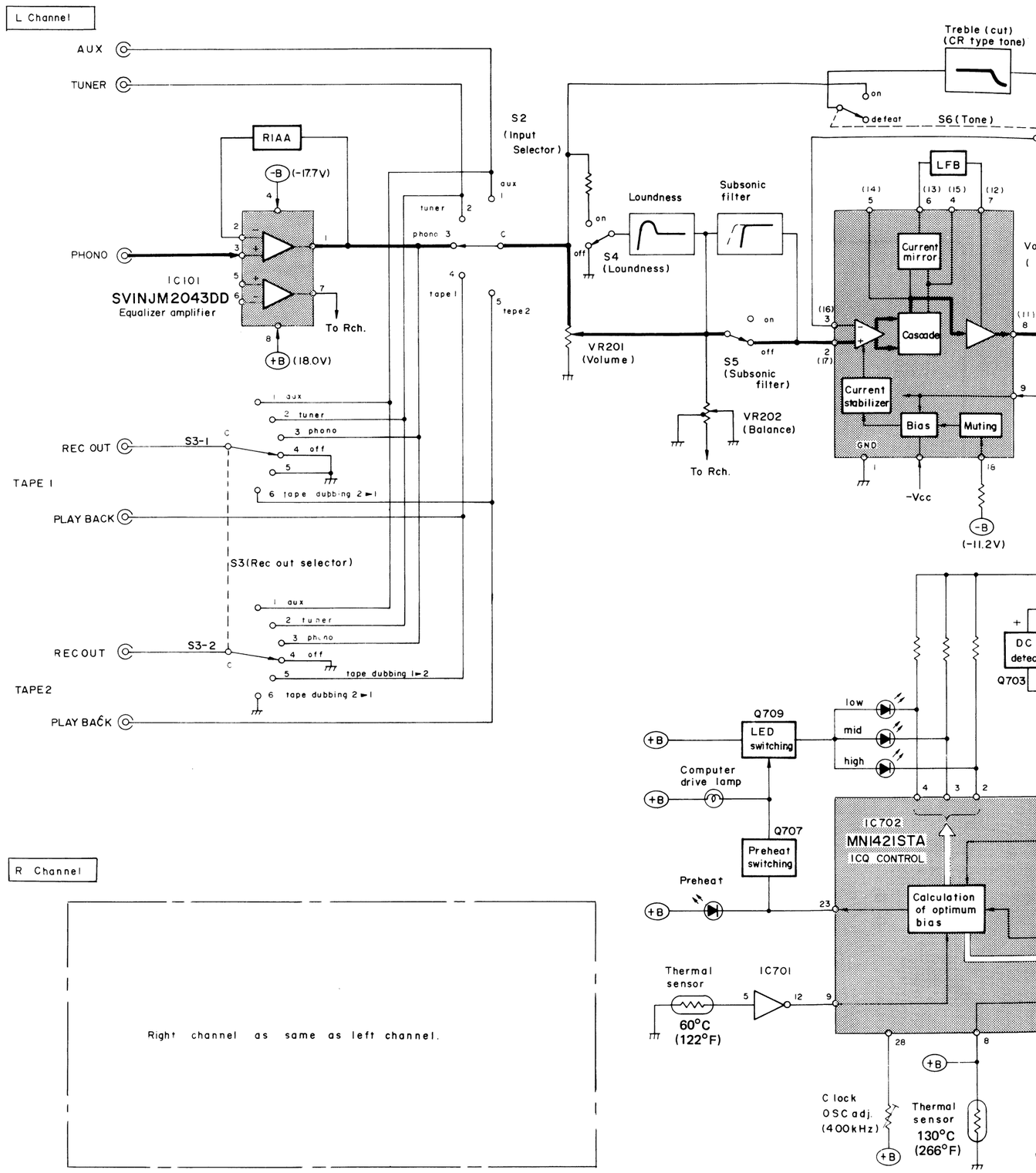
F Icq control, Muting & Protection circuit (Computer)



FUNCTION OF TERMINAL (Icq CONTROLLER IC702)

Pin No.	Mark	Name of block	Description of terminal
1	Vss	Power supply input terminal	Grounded (0V)
2	CO_9	Output port C	It delivers Icq control signal through input port A (thermal sensor) and input port B (signal sensor). [Output "L"]
3	CO_8		
4	CO_7		
5	CO_6		
6	CO_5		
7	AI_3	Input port A	When DC detection circuit of power amplifier operates, the input level becomes "H".
8	AI_2		When 130°C (266°F) sensor of power amplifier operates, the input level becomes "H".
9	AI_1		Not used in this unit
10	AI_0		When 60°C (122°F) sensor of power amplifier operates, the input level becomes "L".
11	BI_3	Input port B	Input level changes to "L" as effective output 2V signal sensor of power amplifier operates. (L ch.)
12	BI_2		Not used in this unit
13	BI_1		Input level changes to "L" as effective output 2V signal sensor of power amplifier operates (R ch.)
14	BI_0		Not used in this unit.
15	EO_0	Output port E	Indicator "thermal" lights up at "L" output.
16	EO_1		Indicator "signal" lights up at "L" output.
17	EO_2		Indicator "auto" lights up at "L" output.
18	EO_3		Indicator "stand by" lights up at "L" output.
19	TST	Test input terminal	Terminal for testing LSI (Grounded)
20	RST	Reset input terminal	All outputs are cleared or reset with input at "L". (It is connected to power supply circuit)
21	SNS_0	Sensor input terminal	Conditional transfer (branach) is performed according to the input level.
22	SNS_1		Input level changes to "H" as power amplifier output short-circuit operates.
23	DO_0	Output port D	Output terminal for indicator "preheat" and preheating circuit operation. [Output "L"]
24	DO_1		Not used in this unit.
25	DO_2		
26	DO_3		Output relay turns ON with output at "H".
27	VDD	Power supply input terminal	Apply 5V.
28	OSC	OSC input terminal	Clock signal (about 400 kHz) can be obtained by internal oscillation circuit.

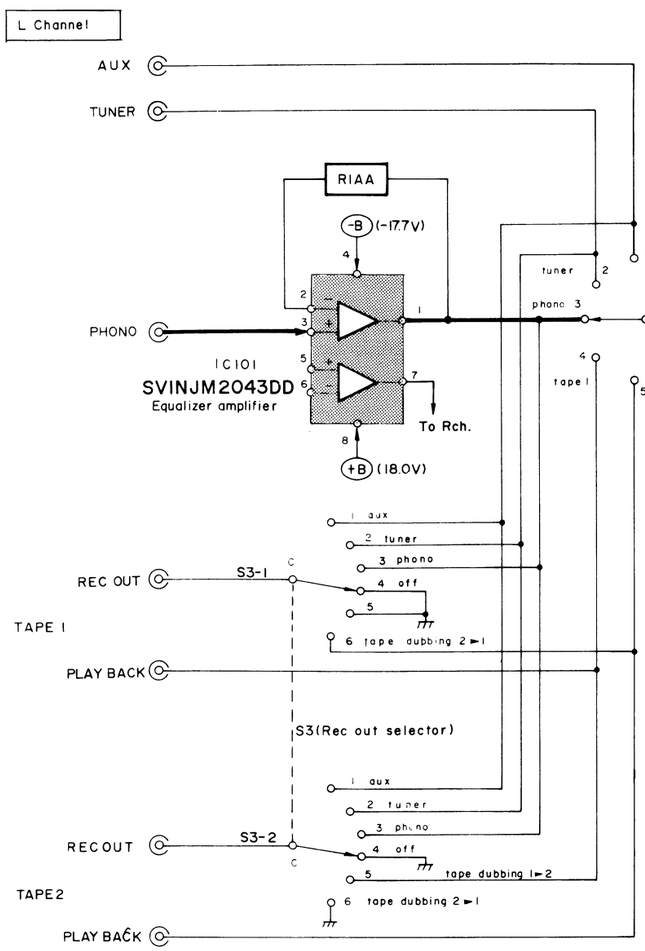
BLOCK DIAGRAM



■ BLOCK DIAGRAM

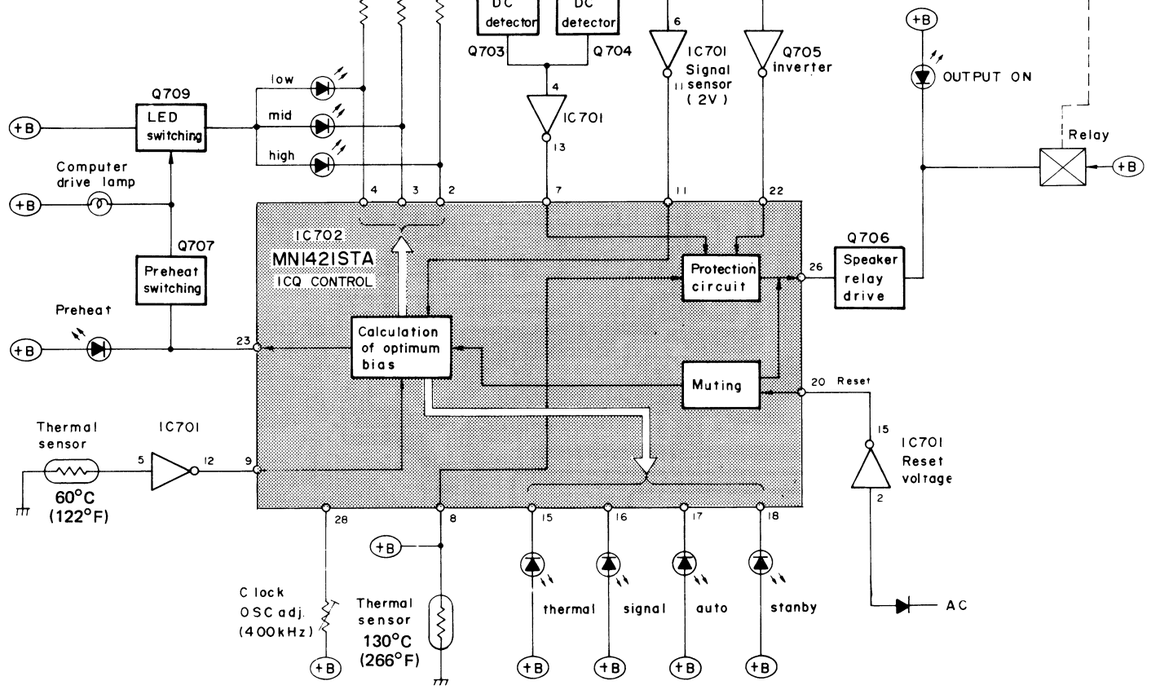
Ground (Earth) lines

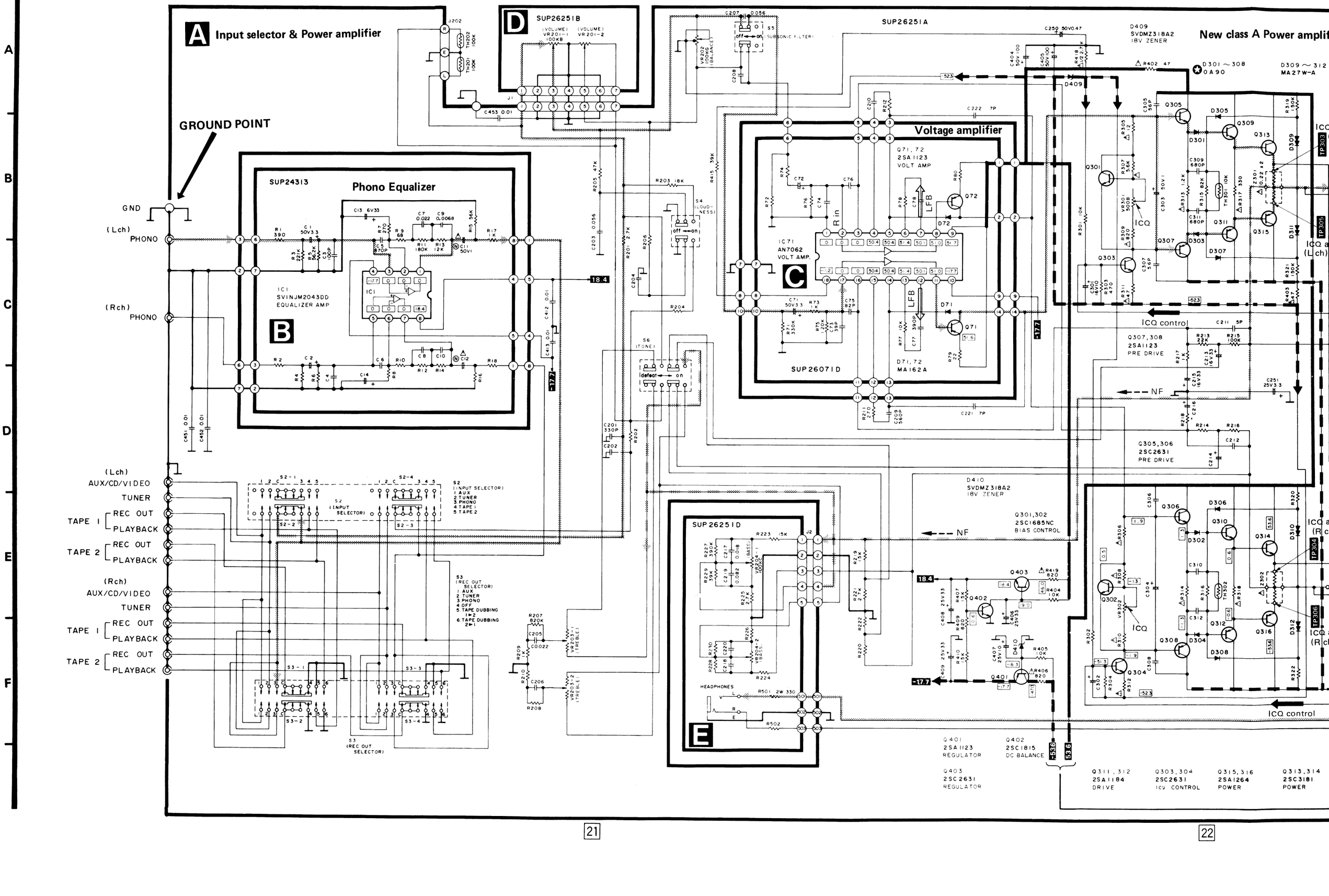
A (thermal sensor)
erates, the
operates, the input
perates, the input
signal sensor of
signal sensor of
rding to the
tput short-circuit
heating circuit opera-
internal oscillation



R Channel

Right channel as same as left channel.




A Input selector & Power amplifier
GROUND POINT
GND
(Lch) PHONO
(Rch) PHONO
SUP24313
Phono Equalizer
IC1 SVINJM2043DD EQUALIZER AMP
B
D SUP26251B
(VOLUME) VR201-1 100KB
(VOLUME) VR201-2
SUP26251A
New class A Power amplif
D409 SVDMZ318A2 18V ZENER
D301~308 0A90
D309~312 MA27W-A
Voltage amplifier
Q71, 72 2SA1123 VOLT AMP
IC71 AN7062 VOLT AMP.
C
SUP26071D
D71, 72 MA162A
ICQ control
Q307, 308 2SA1123 PRE DRIVE
NF
Q305, 306 2SC2631 PRE DRIVE
D410 SVDMZ318A2 18V ZENER
Q301, 302 2SC1685NC BIAS CONTROL
SUP26251D
E
HEADPHONES
Q401 2SA1123 REGULATOR
Q402 2SC1815 DC BALANCE
Q403 2SC2631 REGULATOR
Q311, 312 2SA1184 DRIVE
Q303, 304 2SC2631 ICQ CONTROL
Q315, 316 2SA1264 POWER
Q313, 314 2SC3181 POWER
(Lch) AUX/CD/VIDEO
TUNER
TAPE 1 REC OUT
PLAYBACK
TAPE 2 REC OUT
PLAYBACK
(Rch) AUX/CD/VIDEO
TUNER
TAPE 1 REC OUT
PLAYBACK
TAPE 2 REC OUT
PLAYBACK
S2 (INPUT SELECTOR) 1 AUX 2 TUNER 3 PHONO 4 TAPE 1 5 TAPE 2
S3 (REC OUT SELECTOR) 1 AUX 2 TUNER 3 PHONO 4 OFF 5 TAPE DUBBING 1→2 6 TAPE DUBBING 2→1
S4 (LOUDNESS)
S5 (SUBSONIC FILTER)
S6 (TONE)
ICQ
ICQ control
18.4
-17.7
-53.6

New class A Power amplifier

SUP26251A

Voltage amplifier

Q71, 72
2SA1123
VOLT AMP.

IC71
AN7062
VOLT AMP.

SUP26071D

D71, 72
MA162A

ICQ control

Q307, 308
2SA1123
PRE DRIVE

Q305, 306
2SC2631
PRE DRIVE

D410
SVDMZ318A2
18V ZENER

Q301, 302
2SC1685NC
BIAS CONTROL

SUP26251D

Q401
2SA1123
REGULATOR

Q402
2SC1815
DC BALANCE

Q403
2SC2631
REGULATOR

Q311, 312
2SA1184
DRIVE

Q303, 304
2SC2631
ICQ CONTROL

Q315, 316
2SA1264
POWER

Q313, 314
2SC3181
POWER

Q309, 310
2SC2824
DRIVE

D409
SVDMZ318A2
18V ZENER

D301 ~ 308
0A90

D309 ~ 312
MA27W-A

ICQ adj. (L ch)

ICQ adj. (R ch)

ICQ

Muting relay

D412
MA150

S7 (SPEAKER SELECT)
1 speaker off
2 main
3 remote
4 main + remote

ICQ control, Muting & Protection circuit

SUP26271A

Thermal detector
60°C (140°F), 77Ω
130°C (266°F), 770Ω

IC701
SVITD62501P
INVERTER

D721
MA150

IC702
MN1421STA
ICQ CONTROLLER

Q701, 702
2SC1845
OVER LOAD DET/RELAY DRIVE

Q703
2SC1815
⊕ DC DET

Q704, 705
2SA1015
⊖ DC DET/ INVERTER

Q708
2SD788
REGULATOR

Q706
Q710, 711
2SC3112
RELAY/LED DRIVE

Q712, 713
2SA992
SWITCHING (ICQ CONTROL)

DC detector

Signal level detector

Microcomputer clock adj. (400kHz)

D701 ~ 704
MA162A

D705 ~ 709
MA150

D710 LN820WP

D719 LN420WP

Output indicator
SUP26271D

SUP26271E

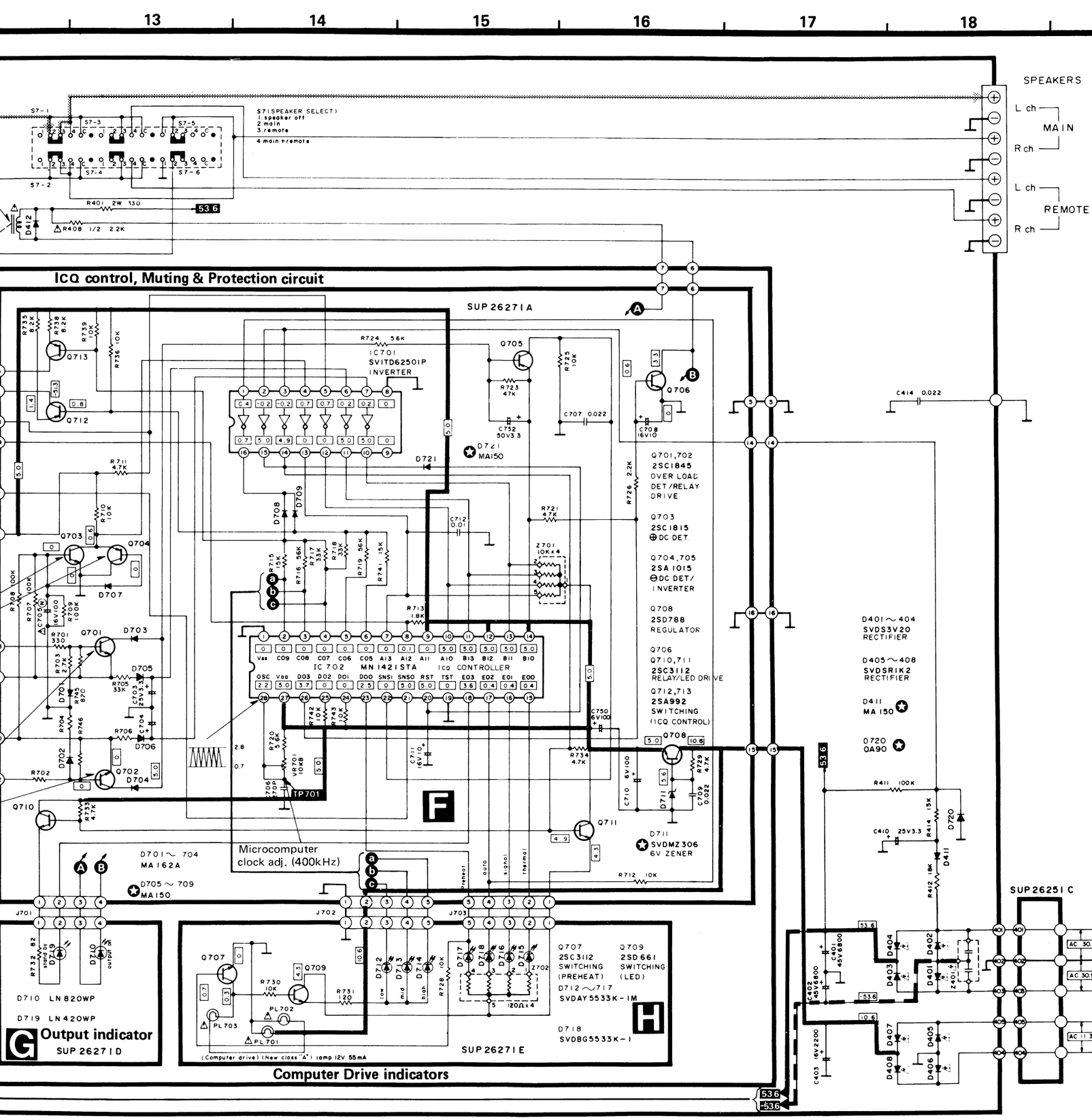
Q707
2SC3112
SWITCHING (PREHEAT)

Q709
2SD661
SWITCHING (LED)

D712 ~ 717
SVDAY5533K-1M

D718
SVDBG5533K-1

Computer Drive indicators



■ SCHEMATIC DIAGRAM

(This shcematic diagram may be modified at any time with the development of new technology.)

- **The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.**
- This is the basic circuit diagram (For continental Europe) of this unit. Note that part of the circuit is subject to change depending on the areas.
- Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas (EF), (EH), (Ei), (XL), (XA), (PA), (PE) and (PC) refer to the separate service manual (Order No. SD83012364C9–A).

Notes:

1. **S2-1 ~ S2-4** : Input selector switch in **"phono"** position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ tape 1 ↔ ⑤ tape 2
2. **S3-1 ~ S3-4** : Recording-mode selector switch in **"off"** position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ off ↔ ⑤ tape dubbing 1▶2 ↔ ⑥ tape dubbing 2▶1
3. **S4** : Loudness switch in **"off"** position.
4. **S5** : Subsonic filter switch in **"off"** position.
   on ↔ off
5. **S6** : Tone switch in **"defeat"** position.
   defeat ↔ on
6. **S7** : Speaker selector switch in **"main"** position.
   1 Speakers off ↔ 2 main ↔ 3 remote ↔ 4 main and remote
7. **S8** : Power source switch in **"on"** position.
8. **S9[XA, PA, PE, PC] only** : Voltge selector switch in **"240V"** position
   120V ↔ 110V ↔ 220V ↔ 240V
9. The headphone jack switch is being short-circuited.
   (With the headphone plug not inserted)
10. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
11. ▭ indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the ground point taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester. (high tap)
12. ⋯⋯ Phono signal lines
13. ━━ Positive (+B) voltage lines
14. ▬▬▶ Negative (–B) voltage lines

■ RESISTORS & CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω(ohm), K = 1000Ω, M = 1000kΩ.
5. The unit of capacitance is μF (microfarad). P = 10^{-6} μF
6. Bracketed indications in Ref. No. Columns specify the area. Parts without these indications can be used for all areas.

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : ± 5%
ERG : Metal Oxide	25 : 1/4W	
	1 : 1W	
	2 : 2W	
	3 : 3W	
	S1 : 1/2W	

ERD10TLJ□□□ → Chip type carbon
ERO10MKG□□□ → Chip type metal film

Capacitor Type	Voltage ECEA Type	Voltage Others	Tolerance
ECEA : Electrolytic	OJ : 6.3V	1H : 50V	C : ± 0.25pF
ECCD : Ceramic	1A : 10V	1C : 16V	D : ± 0.5pF
ECKD : Ceramic	1C : 16V	KC : 400V AC	M : ± 20%
ECQM : Polyester	1E : 25V	1 : 100V	J : ± 5%
ECET : Electrolytic	1H : 50V	45 : 45V DC	K : ± 10%
ECEA..... N: Non Polar Electrolytic	1J : 63V	2H : 500V DC	Z : +80%, −20%
ECQE : Polyester	1V : 35V	2A : 250V AC	N : ± 30%
	50 : 50V		P : +100%, −0%
	25 : 25V		

Ref. No.	Part No.	Value
RESISTORS		
R1, 2	ERD10TLJ391U	390
R3, 4	ERO10MKG2213	221K
R5, 6	ERO10MKG5622	56.2K
R7, 8	ERD10TLJ271U	270
R9, 10	ERD10TLJ680U	68
R11, 12	ERD10TLJ184U	180K
R13, 14	ERD10TLJ123U	12K
R15, 16	ERD10TLJ563U	56K
R17, 18	ERD10TLJ102U	1K
R71, 72	ERD10TLJ334U	330K
R73, 74	ERD10TLJ102U	1K
R75, 76	ERD10TLJ124U	120K
R77, 78	ERD10TLJ103U	10K
R79, 80	ERD10TLJ220U	22
R203, 204 S	ERD25TJ183	18K
R205, 206 S	ERD25TJ473	47K
R207, 208 S	ERD25TJ824	820K
R209, 210 S	ERD25FJ102	1K
R211, 212 S	ERD25FJ271	270
R213, 214 S	ERD25FJ223	22K
R215, 216 S	ERD25TJ104	100K
R217, 218 S	ERD25FJ102	1K
R219, 220 S	ERD25TJ153	15K
R221, 222 S	ERD25FJ272	2.7K
R223, 224 S	ERD25TJ153	15K
R225, 226 S	ERD25FJ272	2.7K
R227, 228 S	ERD25TJ394	390K
R229, 230 S	ERD25TJ393	39K
R301, 302 S	ERD25FJ103	10K
R303, 304 S	ERD25FJ471	470
R305, 306 ⚠S	ERD25FJ120	12
R307, 308 ⚠S	ERD25FJ562	5.6K
R309, 310 ⚠S	ERD25FJ821	820
R311, 312 ⚠S	ERD25FJ470	47
R313, 314 ⚠S	ERD25FJ122	1.2K
R315, 316 S	ERD25TJ823	82K
R317, 318 ⚠S	ERD25FJ331	330
R319, 320 S	ERD25TJ154	150K
R321, 322 S	ERD25TJ154	150K
R323, 324 ⚠	ERDS1FJ100	10
R325, 326 S	ERG1ANJ100	10
R401 S	ERG2ANJ331	330
R402, 403 ⚠S	ERD25FJ470	47
R404, 405 S	ERD25FJ103	10K
R406 ⚠	ERD2FCG821	820

Ref. No.	Part No.	Value
R407 S	ERD25TJ153	15K
R408 ⚠	ERDS1FJ222	2.2K
R409 S	ERD25FJ821	820
R411 S	ERD25TJ104	100K
R412 S	ERD25TJ183	18K
R414 S	ERD25TJ153	15K
R415 S	ERD25TJ393	39K
R418 ⚠	ERDS1FJ272	2.7K
R419 ⚠	ERD2FCG821	820
R501, 502 S	ERG2ANJ331	330
R701, 702 S	ERD25FJ331	330
R703, 704 S	ERD25FJ272	2.7K
R705, 706 S	ERD25TJ333	33K
R707, 708 S	ERD25TJ104	100K
R709 S	ERD25TJ104	100K
R710 S	ERD25FJ103	10K
R711 S	ERD25FJ472	4.7K
R712 S	ERD25FJ103	10K
R713 S	ERD25FJ472	4.7K
R715 S	ERD25TJ153	15K
R716 S	ERD25TJ563	56K
R717, 718 S	ERD25TJ333	33K
R719 S	ERD25TJ563	56K
R720 S	ERD25FJ562	5.6K
R721 S	ERD25FJ472	4.7K
R722 S	ERD25FJ103	10K
R723 S	ERD25TJ563	56K
R724 S	ERD25FJ562	5.6K
R725 S	ERD25FJ103	10K
R726 S	ERD25FJ222	2.2K
R728 S	ERD25FJ103	10K
R729 S	ERD25FJ472	4.7K
R730 S	ERD25FJ103	10K
R731 S	ERD25FJ121	120
R732 S	ERD25FJ820	82
R733, 734 S	ERD25FJ472	4.7K
R735 S	ERD25FJ822	8.2K
R736 S	ERD25FJ103	10K
R738 S	ERD25FJ822	8.2K
R739 S	ERD25FJ103	10K
R741 S	ERD25TJ153	15K
R742, 743 S	ERD25FJ103	10K
R745, 746 S	ERD25FJ821	820

Ref. No.	Part No.	Value
CAPACITORS		
C1, 2 S	ECEA50M3R3R	3.3
C3, 4 S	ECCD1H101K	100P
C5, 6 S	ECKD1H471KB	470P
C7, 8 S	ECQM1H223JZ	0.022
C9, 10 S	ECQM1H682JZ	0.0068
C11, 12 ⚠	ECEA1HN010S	1
C13, 14 S	ECEA1CS330	33
C71, 72 S	ECEA50Z3R3	3.3
C73, 74 S	ECCD1H390K	39P
C75, 76 S	ECCD1H820K	82P
C77, 78 S	ECKD1H391KB	390P
C201, 202 S	ECKD1H331KB	330P
C203, 204 S	ECQM1H563JZ	0.056
C205, 206 S	ECQM1H223JZ	0.022
C207, 208 S	ECQM1H563JZ	0.056
C209, 210 S	ECKD1H561KB	560P
C211, 212 S	ECCD1H050CC	5P
C213, 214 S	ECEA1CS330	33
C215, 216 S	ECEA1CS330	33
C217, 218 S	ECQM1H183JZ	0.018
C219, 220 S	ECQM1H823JZ	0.082
C221, 222 S	ECCD2H070D	7P
C250 S	ECEA50ZR47	0.47
C251 S	ECEA1ES3R3	3.3
C301,302 S	ECEA1HS100	10
C303, 304 S	ECEA50Z1	1
C305, 306 S	ECCD1H560K	56P
C307, 308 S	ECCD1H560K	56P
C309, 310 S	ECKD1H681KB	680P
C311, 312 S	ECKD1H681KB	680P
C313, 314 S	ECKD1H223ZF	0.022
C401, 402	ECETS45V682U	6800
C403 S	ECEA1CS222	2200
C404, 405 S	ECEA1HS101	100
C406 S	ECEA1VS330	33
C407 S	ECEA1HS100	10
C408, 409 S	ECEA1VS330	33
C410 S	ECEA50Z3R3	3.3
C411 S	ECKD1H473ZF	0.047
C412, 413 S	ECKD1H103ZF	0.01
C414 S	ECKD1H223ZF	0.022
C451, 452 S	ECKD1H103ZF	0.01
C453 S	ECKD1H103ZF	0.01
C701, 702 S	ECKD1H472ZF	0.0047

Ref. No.	Part No.	Value
C703, 704 S	ECEA50Z3R3	3.3
C705 ⚠	ECEA1CN101S	100
C706 S	ECCD1H271K	270P
C707 S	ECKD1H223ZF	0.022
C708 S	ECEA1HS100	10
C709 S	ECKD1H223ZF	0.022
C710 S	ECEA1AS101	100
C711 S	ECEA1HS100	10
C712 S	ECKD1H103ZF	0.01
C750 S	ECEA1AS101	100
C752 S	ECEA50Z3R3	3.3
C801, 802 ⚠ [XA] only	ECKDKC222MF	0.0022
C803 ⚠ [XA] only	ECKDKC222MF	0.0022
C803 ⚠ [EF, EH, Ei] only	ECQE2A473MW	0.047
C804 ⚠	ECKDKC222MF	0.0022
C805, 806 ⚠ Except for [XA]	ECKDKC222MF	0.0022
C807 Except for [XA] ⚠	ECKDKC222MF	0.0022
C808, 809 ⚠	ECKDKC103PF	0.01

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part numb
2. Important safety notice: Components identified by ⚠ mark have special chara
When replacing any of these components, use only manufacturer's specified pa
3. Ⓚ —marked parts are used for black only, while ○ —marked parts are for s
4. Part other than Ⓚ — and ○—marked are used for both black and silver type
5. Bracketed indications in Ref. No. Columns specify the area. Parts without thes
6. The "**S**" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM2043DD	Equalizer Amplifier
IC71	AN7062	Voltage Amplifier
IC701	SVITD62501P	Inverter
IC702	MN1421STA	Micro Computer
TRANSISTORS		
Q71, 72	2SA1123−R	Voltage Amplifier
Q301, 302 S	2SC1685−Q	ICQ Control
Q303, 304, 403	2SC2631−R	ICQ Control, Regulator
Q305, 306	2SC2631−R	Pre Drive } Use
Q307, 308	2SA1123−R	Pre Drive } pair ranks
Q309, 310	2SC2824−Y	Drive } Use pair
Q311, 312	2SA1184−Y	Drive } ranks
Q313, 314	2SC3181−R	Power Amplifier } Use pair
Q315, 316	2SA1264−R	Power Amplifier } ranks
Q401	2SA1123−R	Regulator
Q402	2SC1815−Y	Mute Switch
Q701, 702	2SC1845	Over Load Detector, Relay Drive
Q703	2SC1815−Y	DC Detector
Q704, 705	2SA1015−Y	DC Detector Inverter
Q706, 707 710, 711	2SC3112	Switching
Q708	2SA788−D	Regulator
Q709	2SD661−S	Switching
Q712, 713	2SA992	ICQ Control
DIODES		
D71, 72 S	MA162A	Switching
D301~308 S 720	20A90	Synchro Bias
D309~314	MA27W−A	Bias
D401~404 ⚠S	SVDS3V40	Rectifier
D405~408 ⚠	SVDSR1K2	Rectifier
D409, 410	SVDMZ318A2	18V, Zener
D411, 412 S	MA162A	Switching
D413 S	RVDEQA0106S	6V, Zener
D701~709 S 721	MA162A	Switching
D710	LN820WP	LED (Orange), Output ON
D711 S	RVDEQA0106S	6V, Zenner
D712~717	SVDAY5533K1M	LED (Yellow), Computer Drive
D718	SVDBG5533K−1	LED (Green), Computer Drive
D719	LN420WP	LED (Amber), Output stand-by
FUSES		
F1 [XA,PA,PE,PC] ⚠	XBA2C31TRO	T3.1A, 250V
F1 [other] ⚠	XBA2C16TRO	T1.6A, 250V
F2 [XA,PA,PE,PC] ⚠	XBA2C16TRO	T1.6A, 250V
COILS		
L301, 302	SLQY15G−30	Choke
TRANSFORMERS		
T1 [EK,XL] ⚠	SLT5U31	Power Source
T1 [XA,PC] ⚠	SLT5U33	Power Source
T1 [other] ⚠	SLT5U29	Power Source
THERMISTORS		
TH201, 202	RRT104	100kΩ
TH301, 302	ERTD2ZHL103S	10kΩ

Ref. No.	Part No.	Description
LAMP		
PL701~703 ⚠	XAMR74S10	12V, 0.055A
RELAY		
RLY301 ⚠	SSY105	Speaker Out
VARIABLE RESISTORS		
VR201	EWJG2A066B15	Main, 100kΩ
VR202	EWHFNAF20G15	Balance, 100 (G)
VR203	EWCS7AF20012	Treble
VR204	EWCS6A020C15	Bass, 100kΩ
VR301, 302	EVNK6AA00B52	ICQ Adjustm 500Ω (B)
VR701 S	EVNM0AA00B14	Clock 10kΩ (B)
SWITCHES		
S2, 3	ESA2682	Input, Rec C Selector
S4, 5	SSH2049	Subsonic, Loudness
S6	SSH1045	Tone
S7	ESA2718	Speaker
S8 ⚠	ESB90227S	Power Sourc
S9 [XA,PA,PE,PC] ⚠	ESE37219	Voltage Sele
COMPONENT COMBINATION		
Z301, 302 ⚠	ERF3GBKR22N	3W, 0.22Ω (x
Z303	SXRPTH517F02	Thermal Det
Z401 ⚠	SXRFS203ZSM	0.01μF (x2)
Z701	EXBP84103M	10kΩ (x4)
Z702	EXBP84121M	120Ω (x4)

Ref. No.	Parts No.	Description & Pcs
CABINET and CHASSIS PARTS		
1 [PA,PE]○	SYW629	Panel, Front Ass'y
1 [other] ○	SYW627	Panel, Front Ass'y
1 Ⓚ	SYW631	Panel, Front Ass'y
1-1	SGX7435	Holder
2	SBC337−1	Button, Power
3	SBN1153	Knob, Bass, Treble
4	SBN1151	Knob, Speaker, Rec, Input
5	SBC339	Button, Tone, Subson Loudness
6	SBN1153	Knob, Balance
7	SJJ71B	Jack, Headphone
8	SMP303	Holder, Output LED
9	SBN1149	Knob, Volume
10	ESA33273B	Switch, Speaker
11	ESA335012B	Switch, Rec. Selector
12	ESA335013B	Switch, input
13	SMP335−1	Holder, New Class A Indicator
14	SDH545	Reflector Plate
15	SHR401−1	Pin
16	SJT347	Terminal, Fuse
17	SKU9950−4	Bottom Board
18	SKL249	Foot
19	SJF4815−2	Terminal, Speaker
20	SJF3051−3N	Terminal, Input
21 [XA,PC]	SGP3590−2B	Panel, Rear
21 [XL]	SGP3590−3B	Panel, Rear
21 [EK]	SGP3590−1F	Panel, Rear
21 [other]	SGP3590−1D	Panel, Rear
22 [EK] ⚠	QFC1205M	Cord, Power Source
22 [XA,PC] ⚠	SJA111	Cord, power Source
22 [XL] ⚠	QFC1207MA	Cord, Power Source
22 ⚠S [other]	SJA88	Cord, Power Source

s service standard parts and may differ from
s.
stance is Ω(ohm),
M = 1000kΩ.
acitance is μF (microfarad).

ations in Ref. No. Columns specify the area.
ese indications can be used for all areas.

Voltage			Tolerance		
	Others				
V	1H	: 50V	C	: ± 0.25pF	
/	1C	: 16V	D	: ± 0.5pF	
/	KC	: 400V AC	M	: ± 20%	
/	1	: 100V	J	: ± 5%	
/	45	: 45V DC	K	: ± 10%	
/	2H	: 500V DC	Z	: +80%, −20%	
/	2A	: 250V AC	N	: ± 30%	
/			P	: +100%, −0%	
/					

	Value
R3R	3.3
1K	100P
1KB	470P
3JZ	0.022
2JZ	0.0068
10S	1
30	33
R3	3.3
0K	39P
0K	82P
1KB	390P
1KB	330P
3JZ	0.056
3JZ	0.022
3JZ	0.056
1KB	560P
0CC	5P
30	33
30	33
3JZ	0.018
3JZ	0.082
0D	7P
47	0.47
33	3.3
30	10
	1
1K	56P
1K	56P
1KB	680P
1KB	680P
2ZF	0.022
82U	6800
2	2200
1	100
30	33
30	10
30	33
3	3.3
2ZF	0.047
2ZF	0.01
2ZF	0.022
2ZF	0.01
2ZF	0.01
2ZF	0.0047

Ref. No.	Part No.	Value
C703, 704 S	ECEA50Z3R3	3.3
C705 ⚠	ECEA1CN101S	100
C706 S	ECCD1H271K	270P
C707 S	ECKD1H223ZF	0.022
C708 S	ECEA1HS100	10
C709 S	ECKD1H223ZF	0.022
C710 S	ECEA1AS101	100
C711 S	ECEA1HS100	10
C712 S	ECKD1H103ZF	0.01
C750 S	ECEA1AS101	100
C752 S	ECEA50Z3R3	3.3
C801, 802 ⚠ [XA] only	ECKDKC222MF	0.0022
C803 ⚠ [XA] only	ECKDKC222MF	0.0022
C803 ⚠ [EF, EH, Ei] only	ECQE2A473MW	0.047
C804 ⚠	ECKDKC222MF	0.0022
C805, 806 ⚠ Except for [XA]	ECKDKC222MF	0.0022
C807 Except for [XA] ⚠	ECKDKC222MF	0.0022
C808, 809 ⚠	ECKDKC103PF	0.01

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ —marked parts are used for black only, while ○ —marked parts are for silver type only.
4. Part other than Ⓚ — and ○—marked are used for both black and silver type.
5. Bracketed indications in Ref. No. Columns specify the area. Parts without these indications can be used for all areas.
6. The "**S**" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Black type model No. : SU-V303(K)

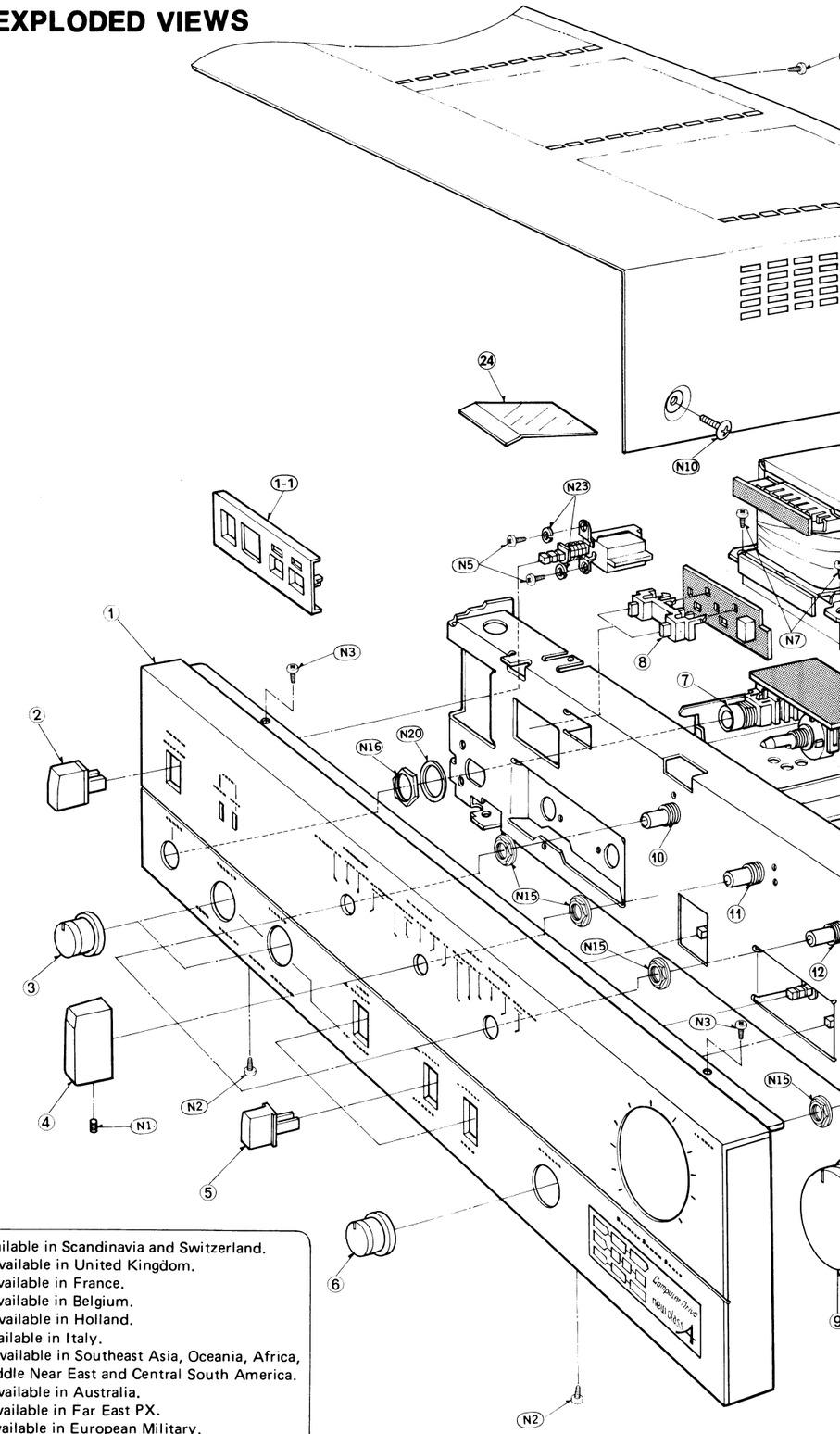
Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM2043DD	Equalizer Amplifier
IC71	AN7062	Voltage Amplifier
IC701	SVITD62501P	Inverter
IC702	MN1421STA	Micro Computer
TRANSISTORS		
Q71, 72	2SA1123−R	Voltage Amplifier
Q301, 302 S	2SC1685−Q	ICQ Control
Q303, 304, 403	2SC2631−R	ICQ Control, Regulator
Q305, 306	2SC2631−R	Pre Drive } Use pair ranks
Q307, 308	2SA1123−R	Pre Drive }
Q309, 310	2SC2824−Y	Drive } Use pair ranks
Q311, 312	2SA1184−Y	Drive }
Q313, 314	2SC3181−R	Power Amplifier } Use pair ranks
Q315, 316	2SA1264−R	Power Amplifier }
Q401	2SA1123−R	Regulator
Q402	2SC1815−Y	Mute Switch
Q701, 702	2SC1845	Over Load Detector, Relay Drive
Q703	2SC1815−Y	DC Detector
Q704, 705	2SA1015−Y	DC Detector Inverter
Q706, 707 710, 711	2SC3112	Switching
Q708	2SA788−D	Regulator
Q709	2SD661−S	Switching
Q712, 713	2SA992	ICQ Control
DIODES		
D71, 72 S	MA162A	Switching
D301~308 S 720	20A90	Synchro Bias
D309~314	MA27W−A	Bias
D401~404 ⚠S	SVDS3V40	Rectifier
D405~408 ⚠	SVDSR1K2	Rectifier
D409, 410	SVDMZ318A2	18V, Zener
D411, 412 S	MA162A	Switching
D413 S	RVDEQA0106S	6V, Zenner
D701~709 S 721	MA162A	Switching
D710	LN820WP	LED (Orange), Output ON
D711 S	RVDEQA0106S	6V, Zenner
D712~717	SVDAY5533K1M	LED (Yellow), Computer Drive
D718	SVDBG5533K−1	LED (Green), Computer Drive
D719	LN420WP	LED (Amber), Output stand-by
FUSES		
F1 [XA,PA,PE,PC] ⚠	XBA2C31TRO	T3.1A, 250V
F1 [other] ⚠	XBA2C16TRO	T1.6A, 250V
F2 [XA,PA,PE,PC] ⚠	XBA2C16TRO	T1.6A, 250V
COILS		
L301, 302	SLQY15G−30	Choke
TRANSFORMERS		
T1 [EK,XL] ⚠	SLT5U31	Power Source
T1 [XA,PC] ⚠	SLT5U33	Power Source
T1 [other] ⚠	SLT5U29	Power Source
THERMISTORS		
TH201, 202	RRT104	100kΩ
TH301, 302	ERTD2ZHL103S	10kΩ

Ref. No.	Part No.	Description
LAMP		
PL701~703 ⚠	XAMR74S10	12V, 0.055A
RELAY		
RLY301 ⚠	SSY105	Speaker Output
VARIABLE RESISTORS		
VR201	EWJG2A066B15	Main, 100kΩ (B)
VR202	EWHFNAF20G15	Balance, 100kΩ (G)
VR203	EWCS7AF20012	Treble
VR204	EWCS6A020C15	Bass, 100kΩ (C)
VR301, 302	EVNK6AA00B52	ICQ Adjustment, 500Ω (B)
VR701 S	EVNM0AA00B14	Clock 10kΩ (B)
SWITCHES		
S2, 3	ESA2682	Input, Rec Out, Selector
S4, 5	SSH2049	Subsonic, Loudness
S6	SSH1045	Tone
S7	ESA2718	Speaker
S8 ⚠	ESB90227S	Power Source
S9 [XA,PA,PE,PC] ⚠	ESE37219	Voltage Selector
COMPONENT COMBINATION		
Z301, 302 ⚠	ERF3GBKR22N	3W, 0.22Ω (x2)
Z303	SXRPTH517F02	Thermal Detector
Z401 ⚠	SXRFS203ZSM	0.01μF (x2)
Z701	EXBP84103M	10kΩ (x4)
Z702	EXBP84121M	120Ω (x4)

Ref. No.	Parts No.	Description & Pcs
CABINET and CHASSIS PARTS		
1 [PA,PE]○	SYW629	Panel, Front Ass'y (1)
1 [other] ○	SYW627	Panel, Front Ass'y (1)
1 Ⓚ	SYW631	Panel, Front Ass'y (1)
1-1	SGX7435	Holder (1)
2	SBC337−1	Button, Power (1)
3	SBN1153	Knob, Bass, Treble (2)
4	SBN1151	Knob, Speaker, Rec, Input (3)
5	SBC339	Button, Tone, Subsonic, Loudness (3)
6	SBN1153	Knob, Balance (1)
7	SJJ71B	Jack, Headphone (1)
8	SMP303	Holder, Output LED (1)
9	SBN1149	Knob, Volume (1)
10	ESA33273B	Switch, Speaker (1)
11	ESA335012B	Switch, Rec. Selector (1)
12	ESA335013B	Switch, input (1)
13	SMP335−1	Holder, New Class A Indicator (1)
14	SDH545	Reflector Plate (1)
15	SHR401−1	Pin (4)
16	SJT347	Terminal, Fuse (2)
17	SKU9950−4	Bottom Board (1)
18	SKL249	Foot (4)
19	SJF4815−2	Terminal, Speaker (1)
20	SJF3051−3N	Terminal, Input (1)
21 [XA,PC]	SGP3590−2B	Panel, Rear (1)
21 [XL]	SGP3590−3B	Panel, Rear (1)
21 [EK]	SGP3590−1F	Panel, Rear (1)
21 [other]	SGP3590−1D	Panel, Rear (1)
22 [EK] ⚠	QFC1205M	Cord, Power Source (1)
22 [XA,PC] ⚠	SJA111	Cord, power Source (1)
22 [XL] ⚠	QFC1207MA	Cord, Power Source (1)
22 ⚠S [other]	SJA88	Cord, Power Source (1)

Ref. No.	Parts No.	Description & Pcs
23 [EK]	SHR129	Bushing, AC Cord (1)
23 [XL]	SHR131	Bushing, AC Cord (1)
23 [other]	SHR127	Bushing, AC Cord (1)
24	SMX747	Insulation Sheet (1)
25 [XA, PA, PE,PC]	SMX745	Insulation Sheet (1)
25 [other]	SMX749	Insulation Sheet (1)
26 ○	SKC1310S1	Cabinet (1)
26 Ⓚ	SKC1310BB1	Cabinet (1)
27 [XA, PA, PE,PC] ⚠	SJS601−2	Socket, AC Outlet (1)
28	SMX685	Cover, (C808, 809) (2)
29	SHR301	Clamper, Lead Wire (2)
SCREWS		
N1 S	XXE4D5FZS	Speaker, Rec, Input Selector (3)
N2 S	XTB3+8BFN	Tapping, ⊕ 3x8 (2)
N3 S	XTB3+8BFN	Tapping, ⊕ 3x8 (2)
N4 S	XTB3+8BFN	Tapping, ⊕ 3x8 (3)
N5 S	XSN3+6S	⊕ 3x6 (2)
N6 S	XTB3+12BFN	Tapping, ⊕ 3x12 (3)
N7 S	XTB4+10BFN	Tapping, ⊕ 4x10 (4)
N8 S	XTN3+8BFN	Tapping, ⊕ 3x8 (4)
N9 S	XTB3+8BFN	Tapping, ⊕ 3x8 (4)
N10 ○	SNE2095−2	Cabinet (2)
N10 Ⓚ	SNE2095−3	Carbint (2)
NUTS		
N15	SNE4021	(5)
N16 S	XNS12	φ12 (1)
WASHERES		
N20	SNE59−1	(1)
N21 S	XWG3	Plain, φ3 (3)
N22 S	XWG3	Plain, φ3 (2)
N23 S	XWA3B	Spring, φ3 (2)
ACCESSORIES		
A1 [PA,PE] ⚠	RJP120ZBS	Plug, AC Adaptor (1)
A2 [XA,PC] only ⚠	SJP5213−1	Plug, AC Adaptor (1)
A3 [XA,PC] only ⚠	SJP5215	Plug, AC Adaptor (1)
A4 [XA,PC]	SQF11615	Instruction Book (1)
A4 [EK]	SQF11691	Instruction Book (1)
A4 [other]	SQF11613	Instruction Book (1)
PACKING PARTS		
P1 [XL]	SPG4277	Carton Box (1)
P1 [EF]	SPG4275	Carton Box (1)
P1 [other]	SPG4273	Carton Box (1)
P2 [XL]	SPS3915−3	Pad, Left (1)
P2 [other]	SPS3915−2	Pad, Left (1)
P3 [XL]	SPS3921−3	Pad, Right (1)
P3 [other]	SPS3921−2	Pad, Right (1)
P4	SPP699	Polyethylene Bag (1)

■ EXPLODED VIEWS



Areas

* [E] is available in Scandinavia and Switzerland.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EB] is available in Belgium.
* [EH] is available in Holland.
* [Ei] is available in Italy.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.
* [PA] is available in Far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

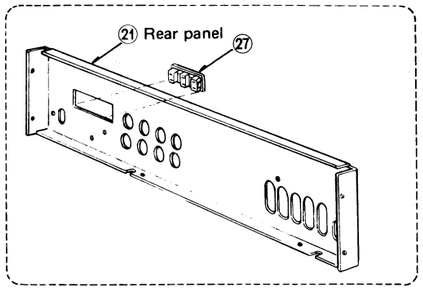
■ EXPLODED VIEWS

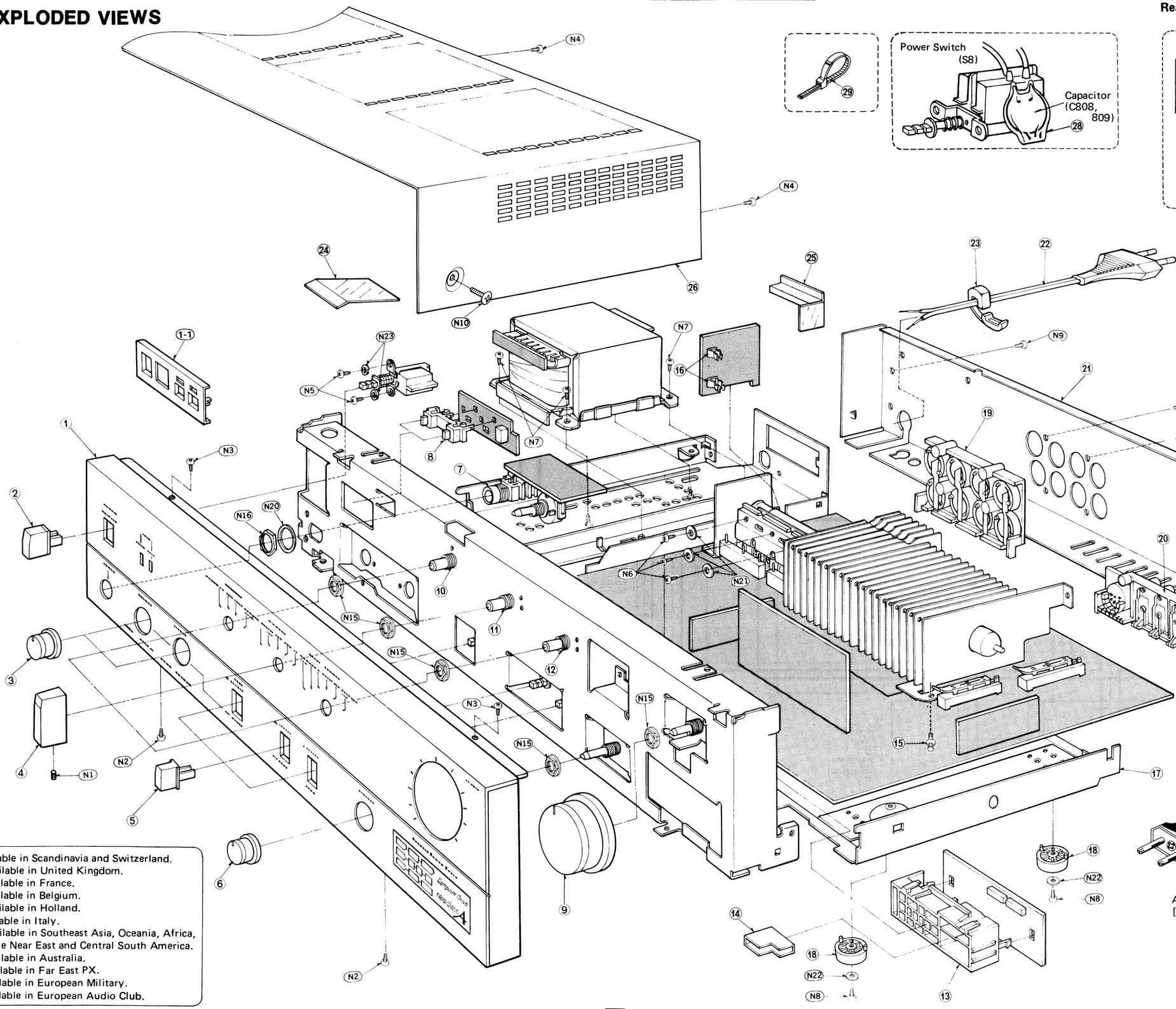
s.

: SU-V303(K)

Description & Pcs	
ning, AC Cord	(1)
ning, AC Cord	(1)
ning, AC Cord	(1)
lation Sheet	(1)
lation Sheet	(1)
lation Sheet	(1)
net	(1)
net	(1)
ket, AC Outlet	(1)
er, (C808, 809)	(2)
nper, Lead Wire	(2)
ker, Rec, Input	
ctor	(3)
ping, ⊕ 3x8	(2)
ping, ⊕ 3x8	(2)
ping, ⊕ 3x8	(3)
3x6	(2)
ping, ⊕ 3x12	(3)
ping, ⊕ 4x10	(4)
ping, ⊕ 3x8	(4)
ping, ⊕ 3x8	(4)
net	(2)
int	(2)
	(5)
	(1)
	(1)
, ϕ3	(3)
, ϕ3	(2)
ng, ϕ3	(2)
AC Adaptor	(1)
AC Adaptor	(1)
AC Adaptor	(1)
uction Book	(1)
uction Book	(1)
uction Book	(1)
n Box	(1)
n Box	(1)
n Box	(1)
Left	(1)
Left	(1)
Right	(1)
Right	(1)
thylene Bag	(1)

Rear panel and AC outlet . . .
for [XA, PA, PE, PC]





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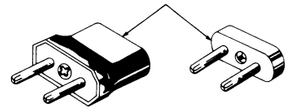
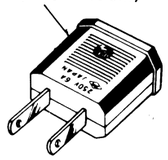
* [XL] is available in Australia.
* [PA] is available in Far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

• Accessories

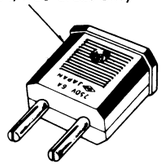
A1 (RJP120ZBS)
[PA, PE] areas only



A2 (SJP5213-1)
[XA, PC] areas only



A3 (SJP5215)
[XA, PC] areas only



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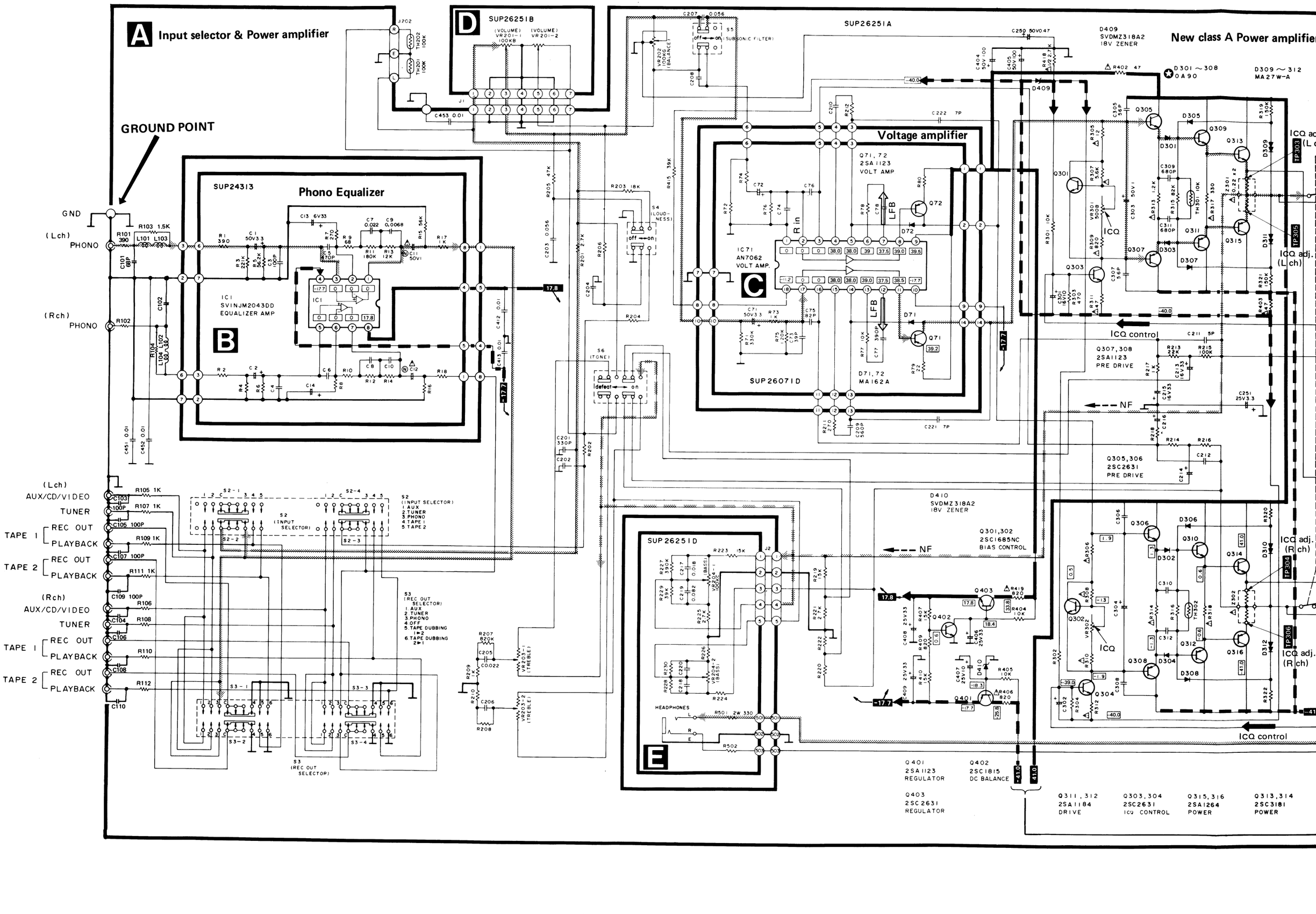
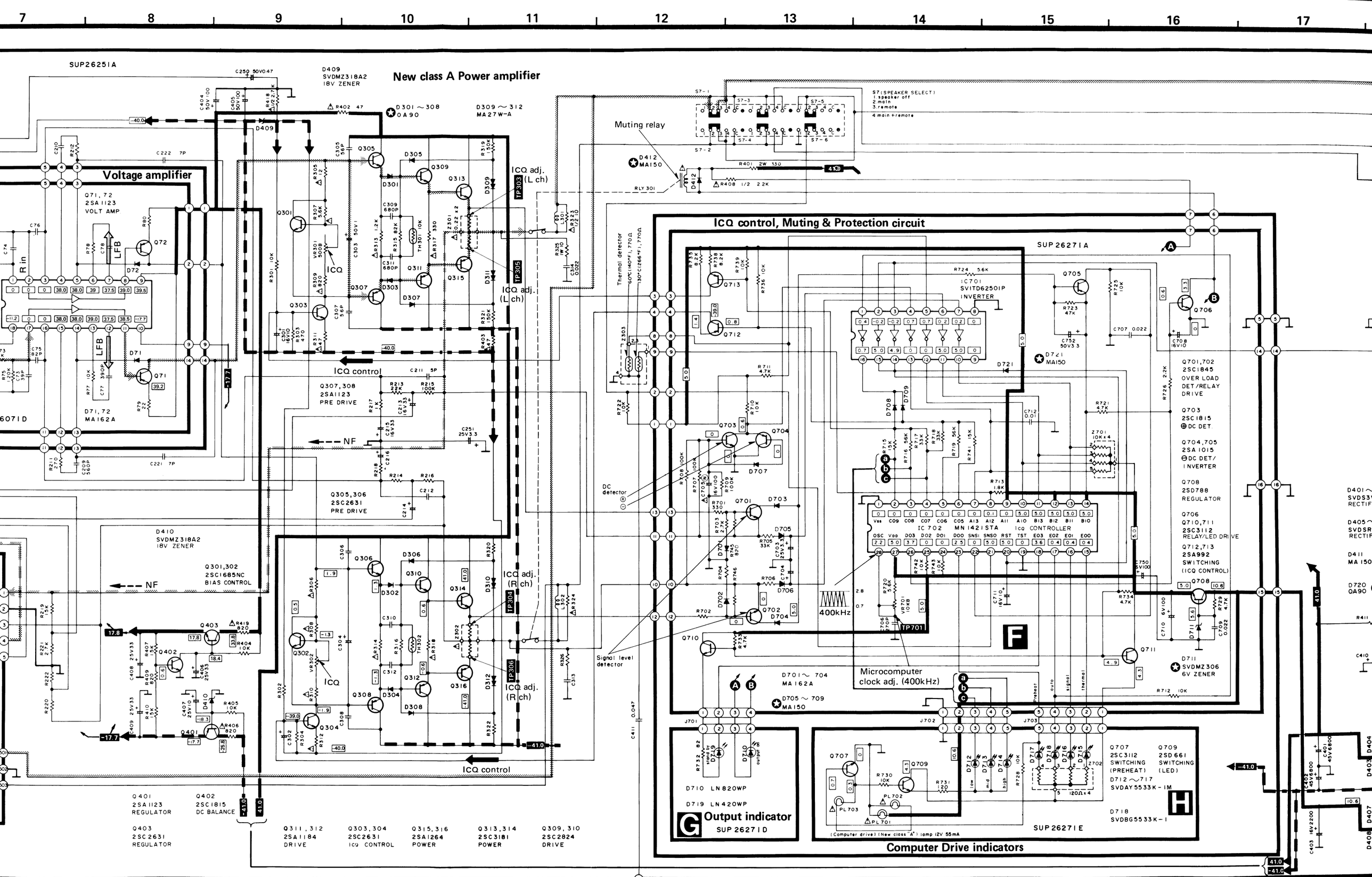
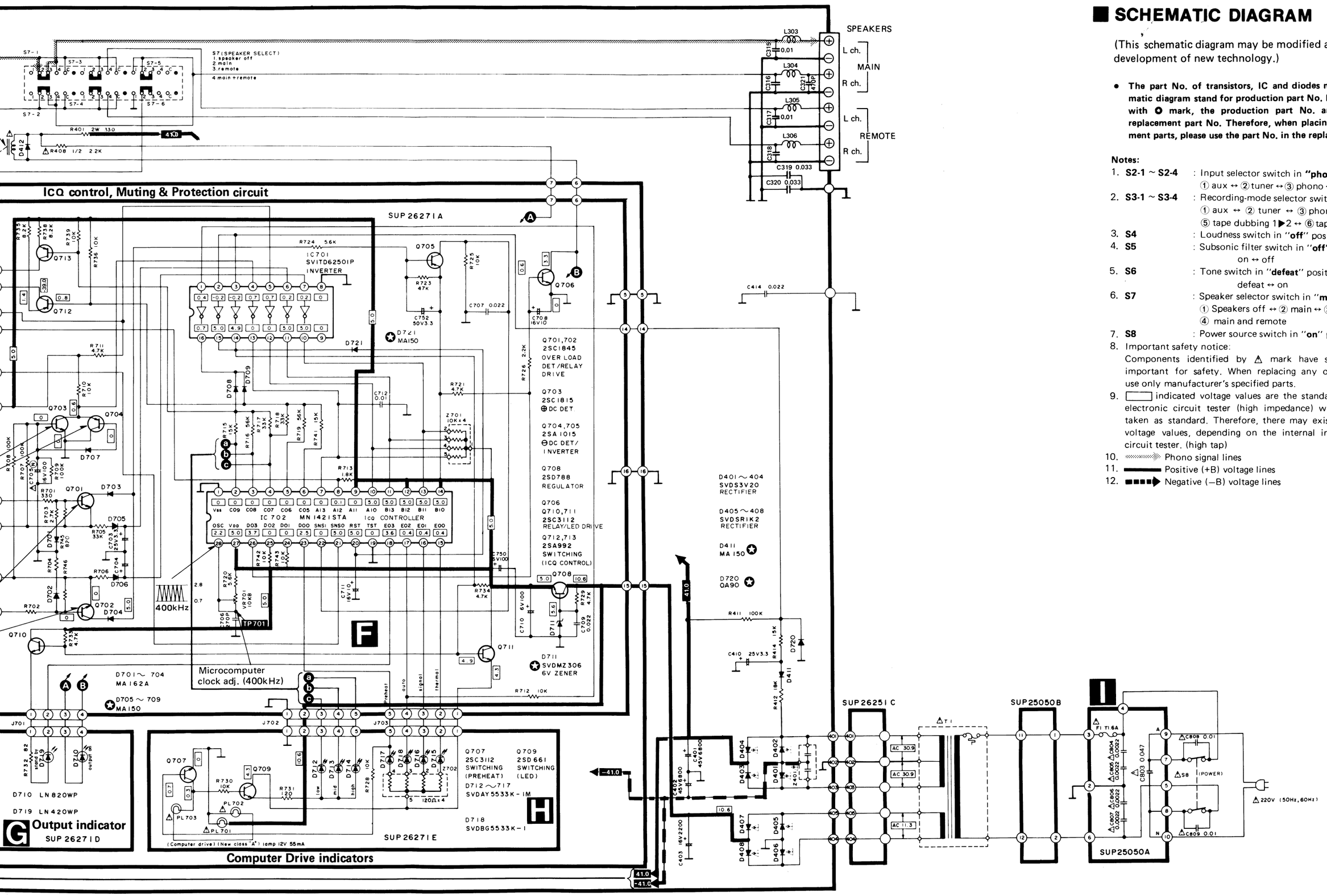

A Input selector & Power amplifier
GROUND POINT
SUP24313
Phono Equalizer
IC1
SVINJM2043DD
EQUALIZER AMP
B
GND
(Lch) PHONO
(Rch) PHONO
R101 390
L101 L103
R103 1.5K
R102
C101 68P
C102
R104 L104 L102
(Lch)
AUX/CD/VIDEO
TUNER
TAPE 1 REC OUT
PLAYBACK
TAPE 2 REC OUT
PLAYBACK
(Rch)
AUX/CD/VIDEO
TUNER
TAPE 1 REC OUT
PLAYBACK
TAPE 2 REC OUT
PLAYBACK
R105 1K
R107 1K
R109 1K
R111 1K
R106
R108
R110
R112
C103 100P
C105 100P
C107 100P
C109 100P
C104
C106
C108
C110
S2 (INPUT SELECTOR)
1 AUX
2 TUNER
3 PHONO
4 TAPE 1
5 TAPE 2
S3 (REC OUT SELECTOR)
1 AUX
2 TUNER
3 PHONO
4 OFF
5 TAPE DUBBING 1→2
6 TAPE DUBBING 2→1
D
SUP26251B
(VOLUME) VR201-1 100KB
(VOLUME) VR201-2
J202
TH202 100K
TH201 100K
J1
C453 0.01
SUP26251A
VR202 100KG (BALANCE)
S5 (SUBSONIC FILTER)
C207 0.056
C208
R203 18K
R205 47K
R206
R204
C203 0.056
R415 39K
S4 (LOUDNESS)
S6 (TONE)
C201 330P
C202
R202
R207 820K
C205 0.0022
R209
R210
C206
R208
VR203-1 (TREBLE)
VR203-2 (TREBLE)
C
Voltage amplifier
Q71, 72
2SA1123
VOLT AMP
IC71
AN7062
VOLT AMP.
SUP26071D
D71, 72
MA162A
D72
Q72
D71
Q71
LFB
R in
C71 50V33
C72
C74
C75 82P
C76
R72
R73 1K
R74
R76
R77 10K
C77 390P
R78
R79 22
C78
R80
C210
R212
C222 7P
C221 7P
R211 270
C209 560P
D
D409
SVDMZ318A2
18V ZENER
New class A Power amplifier
D301 ~ 308
0A90
D309 ~ 312
MA27W-A
R402 47
C250 50V047
C404 50V 100
C405 50V 100
R418 2.7K
C305 50V1
Q305
D305
Q309
Q313
D309
D301
Q301
R307 330
R305 330
R313 1.2K
R315 82K
TH301 10K
R317 330
C309 680P
C311 680P
Z301 0.22 x2
R319 130K
TP303
ICQ adj. (L ch)
TP305
ICQ adj. (L ch)
R301 10K
R309 330
VR301 50K
ICQ
C303 50V1
Q311
Q315
D311
R321 130K
R403 47
Q307
D303
D307
Q303
C307 56P
C310 16V10
R323 470
R311 330
ICQ control
Q307,308
2SA1123
PRE DRIVE
C211 5P
R213 22K
R215 100K
C213 16V33
R217 1K
C215 16V33
C216
C251 25V33
NF
R218
R214
R216
C212
C214
Q305,306
2SC2631
PRE DRIVE
D410
SVDMZ318A2
18V ZENER
Q301,302
2SC1685NC
BIAS CONTROL
NF
Q403
R419 820
R404 10K
Q402
R407 10K
R409 820
C408 25V33
C406 25V33
C409 25V33
R410 1K
C407 25V10
D410
R405 10K
Q401
R406 820
Q306
D306
Q310
Q314
D302
C306
R306
R308
C310
C304
R314
R316
TH302
R318
C302
VR302
ICQ
Q302
Q312
Q316
D312
D304
D308
R320
TP304
ICQ adj. (R ch)
TP306
ICQ adj. (R ch)
R302
R310
R312
Q308
Q304
C308
R304
R322
ICQ control
E
SUP26251D
J2
R223 15K
R227 390K
R229 39K
C217 0.018 (BASS)
C219 0.082
VR204-1 100KG
R225 27K
R226
VR204-2 (BASS)
R230
C220
C218
R228
R224
R219 3K
R221 22K
R222
R220
HEADPHONES
R501 2W 330
R502
S1 (POWER)
S2 (INPUT SELECTOR)
S2-1
S2-2
S2-3
S2-4
S3 (REC OUT SELECTOR)
S3-1
S3-2
S3-3
S3-4
Q401 2SA1123 REGULATOR
Q402 2SC1815 DC BALANCE
Q403 2SC2631 REGULATOR
Q311, 312 2SA1184 DRIVE
Q303, 304 2SC2631 ICQ CONTROL
Q315, 316 2SA1264 POWER
Q313, 314 2SC3181 POWER


SUP26251A
New class A Power amplifier
Voltage amplifier
Q71, 72
2SA1123
VOLT AMP
D71, 72
MA162A
D409
SVDMZ318A2
18V ZENER
D301 ~ 308
0A90
D309 ~ 312
MA27W-A
Muting relay
D412
MA150
RLY 301
S7 (SPEAKER SELECT)
1. speaker off
2. main
3. remote
4. main + remote
ICQ adj. (L ch)
ICQ adj. (R ch)
TP303
TP305
TP304
TP306
ICQ
ICQ control
Q307,308
2SA1123
PRE DRIVE
Q305,306
2SC2631
PRE DRIVE
NF
D410
SVDMZ318A2
18V ZENER
Q301,302
2SC1685NC
BIAS CONTROL
Q401
2SA1123
REGULATOR
Q402
2SC1815
DC BALANCE
Q403
2SC2631
REGULATOR
Q311, 312
2SA1184
DRIVE
Q303, 304
2SC2631
ICQ CONTROL
Q315, 316
2SA1264
POWER
Q313, 314
2SC3181
POWER
Q309, 310
2SC2824
DRIVE
ICQ control, Muting & Protection circuit
SUP26271A
Thermal detector
60°C(140°F), 770Ω
130°C(266°F), 770Ω
IC701
SVITD6250IP
INVERTER
D721
MA150
IC702
MN1421STA
ICQ CONTROLLER
400kHz
Microcomputer clock adj. (400kHz)
Signal level detector
DC detector
D701 ~ 704
MA162A
D705 ~ 709
MA150
Q701,702
2SC1845
OVER LOAD DET/RELAY DRIVE
Q703
2SC1815
DC DET.
Q704,705
2SA1015
DC DET/ INVERTER
Q708
2SD788
REGULATOR
Q706
Q710,711
2SC3112
RELAY/LED DRIVE
Q712,713
2SA992
SWITCHING (ICQ CONTROL)
D711
SVDMZ306
6V ZENER
D401 ~
SVDS3
RECTIF
D405
SVDSR
RECTIF
D411
MA150
D720
0A90
F
G
Output indicator
SUP26271D
D710 LN820WP
D719 LN420WP
H
SUP26271E
Q707
2SC3112
SWITCHING (PREHEAT)
Q709
2SD661
SWITCHING (LED)
D712 ~ 717
SVDAY5533K-1M
D718
SVDBG5533K-1
Computer Drive indicators
(Computer drive) (New class "A") lamp 12V 55mA



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

- **The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.**

Notes:

1. **S2-1 ~ S2-4** : Input selector switch in **"phono"** position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ tape 1 ↔ ⑤ tape 2
2. **S3-1 ~ S3-4** : Recording-mode selector switch in "**off**" position.
   ① aux ↔ ② tuner ↔ ③ phono ↔ ④ off ↔
   ⑤ tape dubbing 1 ▶ 2 ↔ ⑥ tape dubbing 2 ▶ 1
3. **S4** : Loudness switch in "**off**" position.
4. **S5** : Subsonic filter switch in "**off**" position.
   on ↔ off
5. **S6** : Tone switch in "**defeat**" position.
   defeat ↔ on
6. **S7** : Speaker selector switch in "**main**" position.
   ① Speakers off ↔ ② main ↔ ③ remote ↔
   ④ main and remote
7. **S8** : Power source switch in "**on**" position.
8. Important safety notice:
   Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
9. ▭ indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the ground point taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester. (high tap)
10. ⋯⋯ Phono signal lines
11. ——— Positive (+B) voltage lines
12. ■■■▶ Negative (−B) voltage lines

ORDER NO. SD83032438S2

Service Manual

Supplement

Stereo Integrated Amplifier

SU-V303

[EGA]

SU-V303(K)

[EGA]

Please use this manual together with the service manual for Model No. SU-V303, Order No. SD83022391A2.

1. Voltage of schematic diagram was wrong.
2. The correct voltage is shown on the next page.
3. We will send the schematic diagram on which the correct voltage is shown.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SU-V303

- Allow us to correct the voltage values in the schematic diagram.

IC1
SVINJM2043DD
EQUALIZER AMP

Pin	Voltage	Pin	Voltage
1	0	5	0
2	0	6	0
3	0	7	0
4	−17.7	**8**	**18.5**

CHANGE →

Pin	Voltage	Pin	Voltage
1	0	5	0
2	0	6	0
3	0	7	0
4	−17.7	**8**	**17.8**

Q71, 72
2SA1123
VOLT AMP.

Pin	Voltage
E	**51.6**
B	**51.0**
C	1.9

CHANGE →

Pin	Voltage
E	**39.2**
B	**38.5**
C	1.9

IC71
AN7062
VOLTAGE AMP.

Pin	Voltage	Pin	Voltage	Pin	Voltage
1	0	**7**	**50.1**	**13**	**51.4**
2	0	**8**	**51.0**	**14**	**50.4**
3	0	**9**	**51.7**	**15**	**50.4**
4	**50.4**	10	−17.7	16	0
5	**50.4**	**11**	**51.0**	17	0
6	**51.4**	**12**	**50.1**	18	−11.2

CHANGE →

Pin	Voltage	Pin	Voltage	Pin	Voltage
1	0	**7**	**37.5**	**13**	**39.0**
2	0	**8**	**39.0**	**14**	**38.0**
3	0	**9**	**39.5**	**15**	**38.0**
4	**38.0**	10	−17.7	16	0
5	**38.0**	**11**	**38.5**	17	0
6	**39**	**12**	**37.5**	18	−11.2

Q403
2SC2631
REGULATOR

Pin	Voltage
E	**18.4**
B	**19.0**
C	**46.0**

CHANGE →

Pin	Voltage
E	**17.8**
B	**18.4**
C	**33.8**

Q402
2SC1815
DC BALANCE

Pin	Voltage
E	0
B	0.6
C	**19.0**

CHANGE →

Pin	Voltage
E	0
B	0.6
C	**18.4**

Q401
2SA1123
REGULATOR

Pin	Voltage
E	−17.7
B	−18.3
C	**−47.0**

CHANGE →

Pin	Voltage
E	−17.7
B	−18.3
C	**−25.8**

Q309, 310
2SC2824
DRIVE

Pin	Voltage
E	0.6
B	0
C	**53.6**

CHANGE →

Pin	Voltage
E	0.6
B	0
C	**41.0**

Q311, 312
2SA1184
DRIVE

Pin	Voltage
E	−0.6
B	0
C	**−53.6**

CHANGE →

Pin	Voltage
E	−0.6
B	0
C	**−41.0**

Q313, 314
2SC3181
POWER

Pin	Voltage
E	0
B	0.6
C	**53.6**

CHANGE →

Pin	Voltage
E	0
B	0.6
C	**41.0**

Q315, 316
2SA1264
POWER

Pin	Voltage
E	0
B	−0.6
C	**−53.6**

CHANGE →

Pin	Voltage
E	0
B	−0.6
C	**−41.0**

Q303, 304
2SC2631
I_{CQ} CONTROL

Pin	Voltage
E	**−52.3**
B	**−51.3**
C	−1.9

CHANGE →

Pin	Voltage
E	**−40.0**
B	**−39.0**
C	−1.9

Q712, 713
2SA992
SWITCHING

Pin	Voltage
E	1.4
B	0.8
C	**−51.3**

CHANGE →

Pin	Voltage
E	1.4
B	0.8
C	**−39.0**

Printed in Japan
830302200 ⊗ YK

ORDER NO. SD83012364C9–A

Stereo Integrated Amplifier SU-V303/SU-V303(K)

- This booklet contains the specifications and adjusting procedures for SU-V303, written Germany, French and Spanish, and the circuits to be changed according to areas.
- File this manual together with the SU-V303 service manual (Order No. SD83012364C9).

- Diese Broschüre enthält die technischen Daten und die Beschreibungen der Justiermethoden für SU-V303 in deutscher, französischer und spanisher Sprache, sowie die entsprechend dem Gebiet zu ändernden Schaltungen.
- Bewahren Sie das Büchlein zusammen mit der Bedienungsanleitung für SU-V303 (Bestell-Nr. SD83012364C9) auf.

- Cette brochure contient les spécifications et les procédures de réglage pour le SU-V303, écrites en allemand, en français et en espagnol et explique les circuits devant être modifiés selon les régions.
- Classer ce manuel en même temps qu'avec le manuel de service du SU-V303 (N° d'ordre : SD83012364C9).

- Este librito contiene las especificaciones y procedimientos de ajuste para SU-V303, escritas en alemán, francés y español, y los circuitos a cambiarse según las áreas.
- Guardar este manual juntamente con el manual de servicio de SV-V303 (Pedido N°. SD83012364C9).

DEUTSCH

■ TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz
beide Kanäle ausgesteuert: 2 × 45W (4 Ω), 2 × 40W (8 Ω)

Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz
beide Kanäle ausgesteuert: 2 × 45W (4 Ω), 2 × 40W (8 Ω)

Dauerton-Ausgangsleistung bei 1 kHz
beide Kanäle ausgesteuert: 2 × 45W (4 Ω), 2 × 45W (8 Ω)

Gesamtklirrfaktor
Nennleistung bei 20 Hz ~ 20 kHz: 0,03% (4 Ω), 0,005% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz: 0,03% (4 Ω), 0,005% (8 Ω)
Nennleistung bei 1 kHz: 0,007% (4 Ω), 0,003% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz: 0,005% (8 Ω)
halbe Nennleistung bei 1 kHz: 0,003% (8 Ω)
−26 dB Leistung bei 1 kHz: 0,01% (4 Ω)
50 mW Leistung bei 1 kHz: 0,01% (4 Ω)

Intermodulationsfaktor
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω: 0,03%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω: 0,01%

Leistungsbandbreite
beide Kanäle ausgesteuert bei −3 dB
5 Hz ~ 40 kHz (4 Ω, T.H.D. 0,03%)
5 Hz ~ 50 kHz (8 Ω, T.H.D. 0,02%)

Restbrumm und Geräusch: 0,6 mV
Dämpfungsfaktor: 30 (4 Ω), 60 (8 Ω)
Eingangsempfindlichkeit und -impedanz
Phono (PHONO): 2,5 mV/47 kΩ
Tuner, AUX/CD/VIDEO: 150 mV/22 kΩ
Tape 1 (TAPE 1): 150 mV/22 kΩ
Tape 2 (TAPE 2): 150 mV/22 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.): 170 mV
Klangregler
Baßregler (BASS): 50 Hz, +10 dB ~ −10 dB
Höhenregler (TREBLE): 20 kHz, +10 dB ~ −10 dB

Geräuschabstand
Nennleistung (4 Ω)
Phono (PHONO): 76 dB (82 dB nach IHF, A)
Tuner, AUX/CD/VIDEO, Tape: 91 dB (nach IHF, A: 102 dB)
−26 dB Leistung (4 Ω)
Phono (PHONO): 69 dB
Tuner, AUX/CD/VIDEO, Tape: 70 dB
50 mW Leistung (4 Ω)
Phono (PHONO): 65 dB
Tuner, AUX/CD/VIDEO, Tape: 65 dB

Frequenzgang
Phono: RIAA-Standardkurve ±0,8 dB (30 Hz ~ 15 kHz)
Tuner, AUX/CD/VIDEO, Tape: 5 Hz ~ 140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
Tiefenfilter: 30 Hz, -6 dB/Okt.
Gehörrichtige Lautstärkekorrektur (Loudness)
(bei −30 dB Ausgangsleistung): 50Hz, +9 dB
Ausgangsspannung und -impedanz
Aufnahmeausgang (REC OUT): 150 mV
Kanalabweichung (AUX/CD/VIDEO, 250 Hz~6300Hz): ±1 dB
Übersprechdämpfung (AUX/CD/VIDEO, 1 kHz): 63 dB
Kopfhörerpegel und -impedanz: 420mV/330 Ω
Lautsprecherimpedanz
MAIN oder REMOTE: 4 Ω ~ 16 Ω
MAIN und REMOTE: 8 Ω ~ 16 Ω

■ ALLGEMEINE DATEN

Leistungsaufnahme: 340 W
Netzspannung
Für Kontinentaleuropa: Wechselstrom 50 Hz/60 Hz, 220V
Für andere Länder: Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T): 430 × 109 × 290 mm
Gewicht: 6,7 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

■ MESSUNGEN UND JUSTIERUNGEN

1. Justierung des Taktgebers (nach dem Auswechseln des Mikrocomputers)

(1) Die Stromzufuhr abschalten.

(2) VR701 so abgleichen, daß die Zeit bis zum Einschalten des Relais 5~7 Sekunden vom Einschalten der Stromzufuhr beträgt.

* Wenn VR701 entgegen dem Uhrzeigersinn (in Richtung A) gedreht wird, verlängert sich die Zeit (Frequenz verringert sich).

* Wenn VR701 im Uhrzeigersinn (Richtung B) gedreht wird verkürzt sich die Zeit (Frequenz erhöht sich).

(Anmerkung) Die Taktgeberfrequenz von 400kHz wird an TP701 erhalten. Im Falle eines gewöhnlichen Frequenzzählers und Oszilloskops kann die Frequenz aufgrund der Probenkapazität nicht korrekt gemessen werden. Es ist daher empfehlenswert, für die Servicearbeiten die obige Methode anzuwenden.

2. Justierung des Leerlaufs (I_{CQ}) (nach Reparatur des Hauptverstärkers)

(1) Nach der Reparatur ist die Lautstärke auf Minimum einzustellen, bevor der Netzschalter eingeschaltet wird, und es sollte nichts an die Lautsprecheranschlüsse angeschlossen werden.

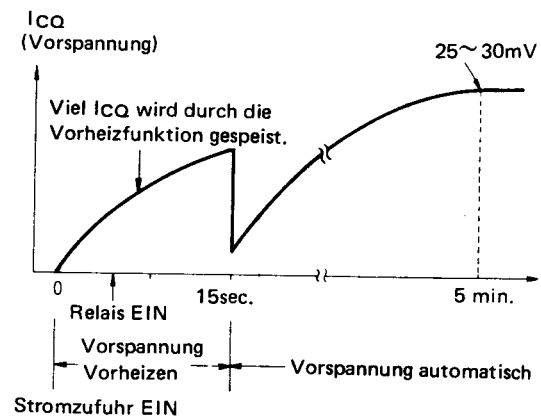
(2) Den I_{CQ}–Regler (VR301, 302) vollständig entgegen dem Uhrzeigersinn drehen.

(3) Die an den Verstärker angelegte Spannung allmählich mit dem Spannungsregler erhöhen und vor Beginn der Justierung ist der Wert in der nachstehenden Tabelle zu überprüfen.

(4) Das elektronische Gleichstrom–Voltmeter an TP303 (+) und TP306 (–) (linker Kanal) oder TP304 (+) und TP306 (–) (rechter Kanal) anschließen.

(5) Nach Ablauf von 5 minuten nach Aufleuchten von Computer Drive Monitor "auto" , VR301 (linker Kanal) oder VR302 (rechter Kanal) auf 25~30mV abgleichen.

* In diesem Gerät wird I_{CQ} durch den Mikrocomputer gesteuert, und I_{CQ} von ein wenig mehr als dem normalen Pegel wird durch "PREHEAT" während 15 Sekunden nach Einschalten der Stromzufuhr gespeist. Nachher werden der Ausgangspegel und die Transistortemperatur durch "AUTO" erfaßt, und dadurch wird I_{CQ} automatisch gesteuert.



* Prüfungen der Schutzschaltung nach Reparatur und Justierung

• Prüfung der Stummschaltung beim Ein– und Ausschalten des Netzschalters

(1) Wechselstrom–Voltmeter und 8Ω–Last (Widerstand oder Lautsprecher an die Haupt–Lautsprecheranschlüsse anschließen.

(2) Die Lautstärke auf einen normalen Pegel einstellen.

(3) Signal von 1kHz, 100mV an dan AUX–Eingangsanschluß anlegen.

(4) Überprüfen, daß die Ausgangsleistung 5 Sek. nach Einschalten des Netzschalters erreicht wird, und daß die Ausgangsleistung sofort beim Ausschalten der Stromzufuhr Null wird.

• Überprüfung der Überlastungs–Detektions– und –Schutzschaltung

(1) Ausgangssignal von 1,5V bei 1kHz an den AUX–Eingangsanschluß anlegen.

(2) Die Hauptlautsprecheranschlüsse (linder Kanal) mit (möglichst kurzem und dickem) Draht kurzschließen; dann überprüfen, daß:

- das Relais ausgeschaltet ist.
- die Ausgangsanzeige "on" erlöscht.
- die Ausgangsanzeige "stand by" blinkt.

(3) Sicherstellen, daß der Zustand (2) bei geöffneter Ausgangsschaltung erreicht wird. Auf entsprechende Weise ist auch der rechte Kanal zu prüfen.

* Wenn das Relais ausgeschaltet ist, die Stromzufuhr ausschalten und einige Zeit ausgeschaltet lassen, bevor sie wieder eingeschaltet wird.
Andernfalls werden die ursprünglichen Zustände nicht wiederhergestellt, auch dann nicht, wenn die Schaltung und die Last normal sind.

FRANÇAIS

■ CARACTERISTIQUES (Sujet á changement sans préaris.)

(DIN 45 500)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz,	2 × 45W (4Ω)
les deux canaux en circuit	2 × 40W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz,	2 × 45W (4Ω)
les deux canaux en circuit	2 × 40W (8Ω)
Puissance de sortie continue à 1 kHz	2 × 45W (4Ω)
les deux canaux en circuit	2 × 45W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,03% (4Ω) 0,005% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,03% (4Ω) 0,005% (8Ω)
à puissance nominale (1 kHz)	0,007% (4Ω) 0,003% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,005% (8Ω)
à demi-puissance (1 kHz)	0,003% (8Ω)
puissance de −26 dB à 1 kHz	0,01% (4Ω)
puissance de 50 mW à 1 kHz	0,01% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,03%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,01%
Réponse de fréquences	
les deux canaux en circuit, −3 dB	5 Hz~40 kHz (4Ω, T.H.D. 0,03%)
	5 Hz~50 kHz (8Ω, T.H.D. 0,02%)
Bruit et ronflement résiduels	0,6 mV
Coefficient d'amortissement	30 (4Ω), 60 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
SYNTONISATEUR, AUX/CD/VIDEO	150 mV/22kΩ
BANDE 1 (TAPE 1)	150 mV/22kΩ
BANDE 2 (TAPE 2)	150 mV/22kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	170 mV
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	76 dB (82 dB, IHF, A)
SYNTONISATEUR, AUX/CD/VIDEO, BANDE	91 dB (IHF, A: 102 dB)
puissance de −26 dB (4Ω)	
PHONO	69 dB
SYNTONISATEUR, AUX/CD/VIDEO, BANDE	70 dB
puissance de 50 mW (4Ω)	
PHONO	65 dB
SYNTONISATEUR., AUX/CD/VIDEO, BANDE	65 dB
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,8 dB (30 Hz~15 kHz)
SYNTONISATEUR, AUX/CD/VIDEO, BANDE	5 Hz~140 kHz (−3 dB) +0 dB, −0,2 dB (20 Hz~20 kHz)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtre subsonique	30 Hz, −6 dB/oct.
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT (REC OUT)	150 mV
Equilibrage des canaux, AUX/CD/VIDEO 250 Hz~6 300 Hz	±1 dB
Séparation des canaux, AUX/CD/VIDEO 1 kHz	63 dB
Niveau de sortie des casques et impédance	420 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

■ DIVERS

Consommation	340W
Alimentation	
Pour l'Europe	CA 50 Hz/60 Hz, 220V
Autres	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 109 × 290 mm
Poids	6,7 kg

Remarques:

1. On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Syste—me H.P. 3045).
2. La Sociítl NATIONAL-PANASONIC-FRANCE, importateur du matíriel MATSUSHITA-ELECTRIC díclare que cet appareil est conforme aux prescriptions de la directive 76$889$C.E.E (arre%tí 14 Janvier 1980).

■ MESURAGES ET RÉGLAGES

1. Ajustement des impulsions de rythme (après la remise en place du micro-ordinateur)

(1) Mettre hors circuit l'alimentation.

(2) Ajuster VR701 de telle sorte que la durée jusqu'à ce que le relais se mette en circuit soit de 5~7-sec. après la mise en marche.

* La durée s'allonge avec VR701 tourné dans le sens inverse des aiguilles d'une montre (dans la direction de A). (La fréquence diminue.)

* La durée raccourcit avec VR701 tourné dans le sens des aiguilles d'une montre (dans la direction de B). (La fréquence augmente.)

(Nota) Une fréquence d'impulsions de rythme de 400 kHz est obtenue à TP701 Dans le cas d'un oscilloscope et d'un compteur à fréquence normale, la fréquence ne peut être mesurée correctement à cause de la capacité de la sonde. Aussi, il est conseillé d'utiliser la méthode mentionnée cidessus pendant le dépannage.

2. Ajustement de la marche à vide (ICQ) (après réparation de l'amplificateur principal)

(1) Après la réparation, régler le volume sonore au minimum avant la mise en circuit de l'interrupteur d'alimentation, et ne rien raccorder aux bornes des haut-parleurs.

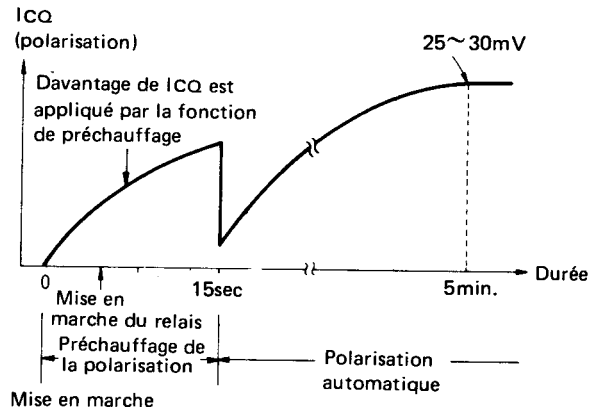
(2) Tourner entièrement dans le sens inverse des aiguilles d'une montre la commande ICQ (VR301 et 302).

(3) Augmenter graduellement la tension appliquée à l'amplificateur à partir de OV au moyen du régulateur de tension, et vérifier la valeur d'après le tableau ci-dessous avant de commencer l'ajustement.

(4) Brancher un voltmètre électronique à C.C. à TP303 (+) et à TP305 (–) (canal de gauche) ou à TP304 (+) et TP306 (–) (canal de droite).

(5) Lorsque 5 minutes se sont écoulées après que le contrôleur d'entraînement "auto" de l'ordinateur se soit éclairé, ajuster VR301 (canal de gauche) ou VR302 (canal de droite) sur 25~30mV.

* Dans cet appareil, ICQ est contrôlé par le micro-ordinateur et ICQ, un peu plus que le niveau normal, est appliqué par le "PRECHAUFFAGE" ("Preheat") pendant à peu près 15 secondes après la mise en marche. Après cela, le niveau de sortie et la température du transistor sont détectés par "AUTO", contrôlant automatiquement ainsi ICQ.



* Vérifications du circuit de protection après la réparation et l'ajustement

• Vérification de l'accord silencieux avec l'énergie sur Marche/Arrêt.

(1) Brancher un voltmètre à C.A. et une charge de 8Ω (résistance ou haut-parleur) aux bornes du haut-parleur principal.

(2) Régler le volume sonore sur un niveau approprié.

(3) Appliquer un signal de 1 kHz 100 mV à la borne d'entrée AUX.

(4) S'assurer que la puissance de sortie est augmentée 5 –sec. après la mise en circuit ("on") de l'interrupteur d'alimentation, et que la sortie s'achève immédiatement après avoir mis l'interrupteur d'alimentation hors circuti ("off").

• Vérification d'une détection de surcharge et du circuit de protection

(1) Appliquer un signal de sortie d'à peu près 1,5V à 1 kHz à la borne d'entrée AUX.

(2) Avec les bornes du haut-parleur principal (canal de gauche) court-circuitées par un fil d'amenée (aussi épais et court que possible):

S'assurer que
- le relais est hors circuit.
- l'indicateur de sortie "on" (marche) s'éteigne.
- l'indicateur de sortie "stand by" (attente) clignote.

(3) S'assurer que la condition de (2) soit obtenue avec le circuit de sortie ouvert. De même, vérifier aussi le canal de droite.

* Lorsque le relais est hors circuit, tourner l'énergie de l'appareil sur "off" pendant un certain temps avant de remettre en marche ("on").
Sans quoi, les conditions originales ne seront pas rétablies même lorsque le circuit et la charge sont normaux.

ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

(DIN 45 500)

■ SECCION AMPLIFICADOR

Potencia continua de 20 Hz~20 kHz
en ambos canales 2 × 45W (4Ω)
2 × 40W (8Ω)

Potencia continua de 40 Hz~16 kHz
en ambos canales 2 × 45W (4Ω)
2 × 40W (8Ω)

Potencia continua de 1 kHz
en ambos canales 2 × 45W (4Ω)
2 × 45W (8Ω)

Distorsión armónica total
potencia de régimen a 20 Hz~20 kHz 0,03% (4Ω)
0,005% (8Ω)
potencia de régimen a 40 Hz~16 kHz 0,03% (4Ω)
0,005% (8Ω)
potencia de régimen a 1 kHz 0,007% (4Ω)
0,003% (8Ω)
mitad de potencia a 20 Hz~20 kHz 0,005% (8Ω)
mitad de potencia a 1 kHz 0,003% (8Ω)
−26 dB de potencia a 1 kHz 0,01% (4Ω)
50 mW de potencia a 1 kHz 0,01% (4Ω)

Distorsión por intermodulación
potencia de régimen a 250 Hz: 8 kHz=4:1, 4Ω 0,03%
potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω 0,01%

Ancho de banda de potencia
con ambos canales, −3 dB
5 Hz~40 kHz (4Ω, T.H.D. 0,03%)
5 Hz~50 kHz (8Ω, T.H.D. 0,02%)

Zumbido residual y ruido 0,6 mV
Factor de amortiguamiento 30 (4Ω), 60 (8Ω)
Sensibilidad e impedancia de entrada
TOCADISC. (PHONO) 2,5 mV/47kΩ
SINTON., AUX/CD/VIDEO. (TUNER, AUX/CD/VIDEO) 150 mV/22kΩ
GRAB. 1 (TAPE 1) 150 mV/22kΩ
GRAB. 2 (TAPE 2) 150 mV/22kΩ
Voltaje máximo de entrada de PHONO (1 kHz, RMS) 170 mV
Filtro subsónico 30 Hz, −6 dB/oct.
Control de sonoridad (volumen a −30 dB) 50 Hz, +9 dB
Voltaje e impedancia de salida
SAL. GRAB. (REC OUT) 150 mV

Relación de señal a ruido
potencia de régimen (4Ω)
TOCADISC. (PHONO) 76 dB (82 dB, IHF, A)
SINTON., AUX/CD/VIDEO, GRAB. (TUNER, AUX/CD/VIDEO, TAPE) 91 dB (IHF, A: 102 dB)
−26 dB de potencia (4Ω)
TOCADISC. (PHONO) 69 dB
SINTON., AUX/CD/VIDEO, GRAB. (TUNER, AUX/CD/VIDEO, TAPE) 70 dB
50 mW de potencia (4Ω)
TOCADISC. (PHONO) 65 dB
SINTON., AUX/CD/VIDEO, GRAB. (TUNER, AUX/CD/VIDEO, TAPE) 65 dB
Respuesta de frecuencia
TOCADISC. (PHONO) curva RIAA estándar ±0,8 dB (30 Hz~15 kHz)
SINTON., AUX/CD/VIDEO, GRAB. (TUNER, AUX/CD/VIDEO, TAPE) 5 Hz~140 kHz (−3 dB)
+0 dB, −0,2 dB (20 Hz~20 kHz)
Controles de tono
BAJOS (BASS) 50 Hz, +10 dB~ −10 dB
AGUDOS (TREBLE) 20 kHz, +10 dB~ −10 dB
Equilibrio de canales, AUX/CD/VIDEO 250Hz~6300Hz ±1 dB
Separación de canales, AUX/CD/VIDEO 1 kHz 63 dB
Impedancia y nivel de salida de los auriculares 470 mV/330Ω
Impedancia de carga
MAIN o REMOTE 4Ω~16Ω
MAIN y REMOTE 8Ω~16Ω

■ GENERAL

Consumo de energía 340W
Alimentación de energía
Para Europa continental CA 50 Hz/60 Hz, 220V
Para otros paises CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensiones (An.×Al.×Prof.) 430 × 109 × 290 mm
Peso 6,7 kg

Nota:
La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

■ MEDICIONES Y AJUSTE

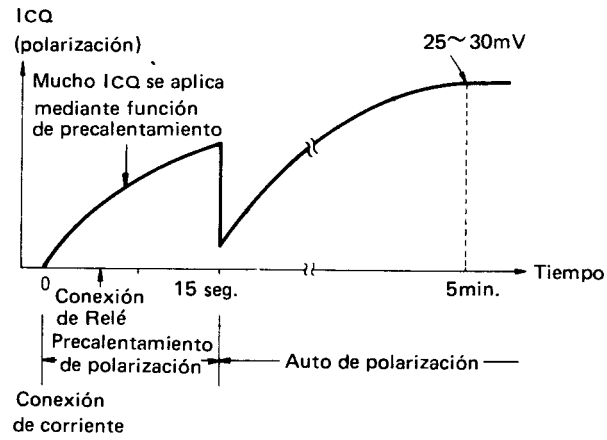
1. Ajuste de Reloj (después de reemplazar el microcomputador)

(1) Desconecte la fuente de alimentación.
(2) Ajuste VR701 de manera que el tiempo, hasta que el relé se conecte, sea 5~7-seg. después de conectarse la corriente.
  * El tiempo se prolonga con VR701 girado a la izquierda (en la dirección de A). (La frecuencia disminuye.)
  * El tiempo se acorta con VR701 girado a la derecha (en la dirección de B). (La frecuencia aumenta.)

(Nota) La frecuencia de reloj de 400 kHz se obtiene en TP701 . En el caso de un contador de frecuencia y osciloscopio ordinarios, la frecuencia no se puede medir correctamente debido a la capacidad de prueba. Por lo tanto, se recomienda emplear el método antes mencionado durante la prestación de servicio.

2. Ajuste de Marcha en Vacìo (ICQ) (después de reparar el amp. principal)

(1) Después de la reparación, ajuste el volumen de sonido al mínimo antes de conectar el interruptor de alimentación, y no conecte nada a los terminales de altavoz.
(2) Gire completamente el control ICQ (VR301, 302) a la izquierda.
(3) Aumente el voltaje aplicado al amplificador gradualmente desde 0V mediante un regulador de voltaje, y asegúrese del valor en la tabla de abajo antes de comenzar el ajuste.
(4) Conecte el voltímetro electrónico de CC a TP303 (+) y TP305 (−) (canal izquierdo) o TP304 (+) y TP306 (−) (canal derecho).
(5) Cuando 5 minutos han pasado después que el "auto" de monitor de impulsión de computador se enciende, ajuste VR301 (canal izquierdo) o VR302 (canal derecho) a 25~30mV.
  * En este aparato, ICQ es regulado mediante computador, y ICQ un poco más del nivel normal se aplica mediante "PRECALENTAMIENTO" por unos 15 seg. después de conectarse la corriente. Después de eso, el nivel de salida y la temperatura de transistor se detectan mediatne "AUTO", regulando así automáticamente ICQ.



* Chequeos de Circuito de Protección Después de Reparación y Ajuste

- **Chequeo de Silenciamiento con Conexión/Desconexión de Corriente.**

(1) Conecte voltímetro de CA y carga de 8Ω (resistor o altavoz) a terminales de altavoz principal.
(2) Ajuste el volumen de sonido a un nivel apropiado.
(3) Aplique señal de 1 kHz 100 mV a terminal de entrada AUX.
(4) Asegúrese de que salida ha ganado 5 – seg. después de la conexión de interruptor de alimentación, y que la salida desaparece inmediatamente después de la desconexión del interruptor de alimentación.

- **Chequeo de Detección de Sobrecarga y Circuito de Protección**

(1) Aplique señal de salida de aprox. 1,5V a 1kHz a terminal de entrada AUX.
(2) Con terminales de altavoz principal (canal izquierdo) cortocircuitados mediante alambre de plomo (lo más grueso y corto posible):

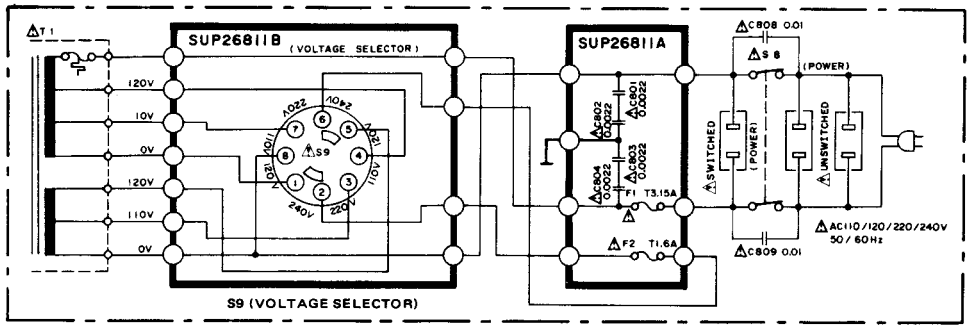
Asegúrese de que
- relé está desconectado.
- indicador de salida "encendido" se apaga.
- indicador de salida "de reserva" parpadea.

(3) Asegúrse de que el estado de (2) ha ganado con circuito de salida abierto. Similarmente, chequee el canal derecho también.
  * Cuando el relé está desconectado, desconecte la corriente y unidad por un tiempo antes de conectarla. De lo contrario, las condiciones originales no se restauran aun cuando el circuito y la carga sean normales.

■ CIRCUITS TO BE CHANGED AND THE AREAS

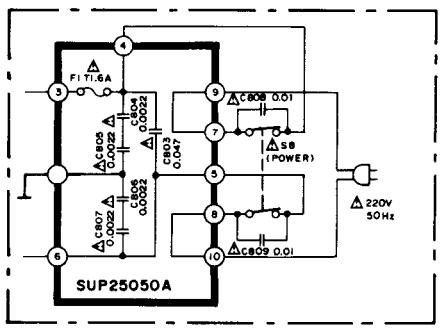
- **Power source circuit**

For [XA],[PA],[PE] and [PC] areas.



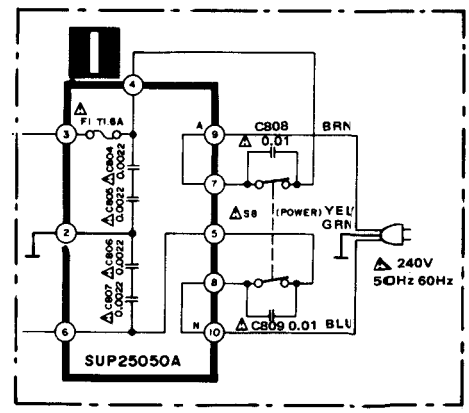
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [PA] is available in Far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

For [EF],[EH],[Ei] areas.



* [EF] is available in France.
* [EH] is available in Holland.
* [Ei] is available in Italy.

For [XL] area.



* [XL] is available in Australia.

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